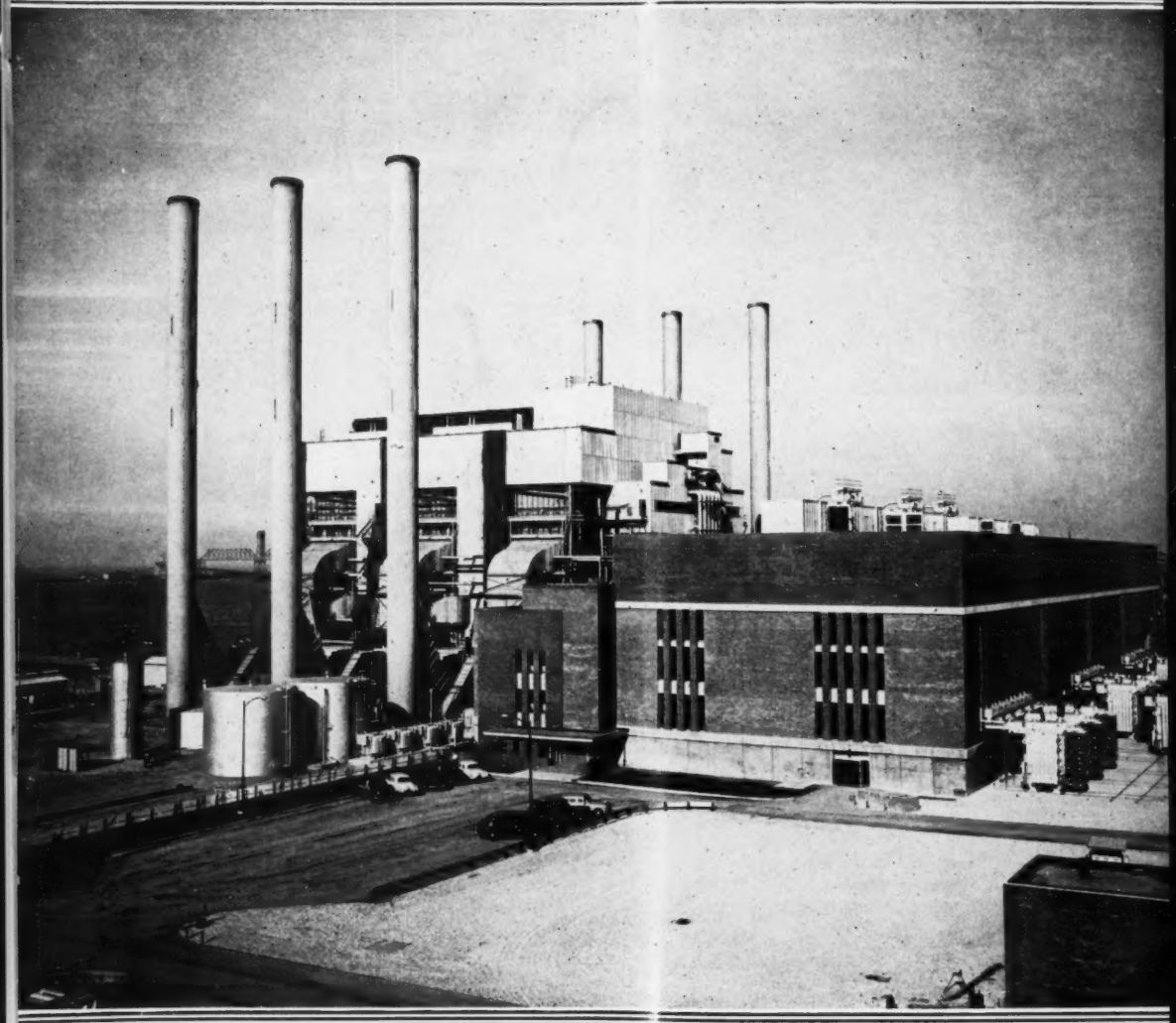
ELECTRICAL WEST

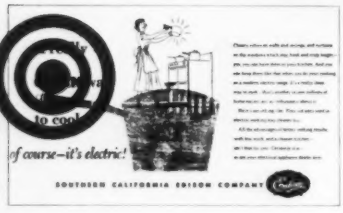
Give enough!

October 1951
25 Cents



Annual Industrial Issue

SPOKESMAN FOR THE MOST HIGHLY ELECTRIFIED REGION OF THE U. S.



On Target!

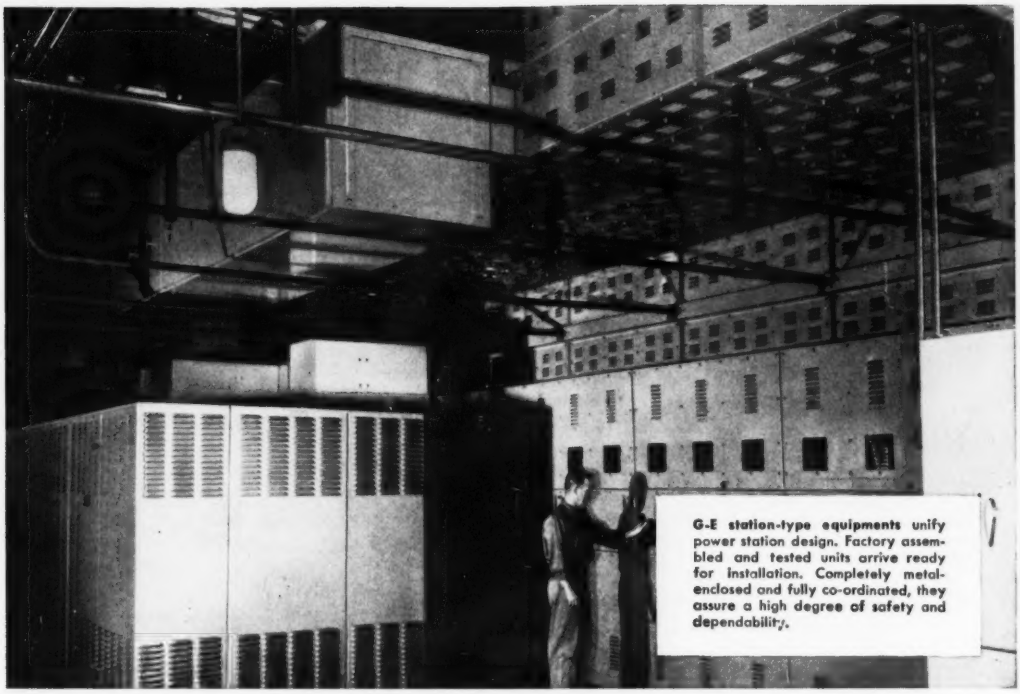
Cooking is a familiar job to most women. So naturally, when you talk about *better* cooking results with *less* work, you are talking every woman's language. That's why we believe the sales target is brought into really close range when the convenience, time and labor saving features of electric cooking are headlined and explained.

These Edison newspaper advertisements on electric ranges are doing exactly that, with detailed emphasis. Each hits hard on one advantage of electric cooking, then points the way to the dealer's store as the place to get that advantage.

We think it's the soundest kind of selling strategy—to emphasize the *benefits* of electric ranges instead of the specifications and details—because although an electric range is something many women might like to have, a *better way to cook* is every woman's target.

Edison

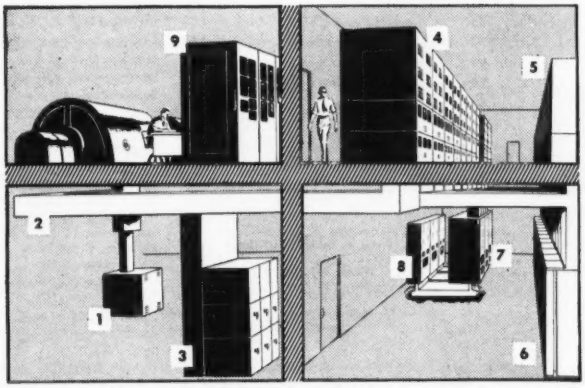
SOUTHERN CALIFORNIA EDISON COMPANY



G-E station-type equipments unify power station design. Factory assembled and tested units arrive ready for installation. Completely metal-enclosed and fully co-ordinated, they assure a high degree of safety and dependability.

FORMULA FOR UNIFIED POWER STATION DESIGN . . .

Complete project planning with packaged equipment



Artist's view of typical station switchgear, of which the various components are: (1) Neutral grounding breaker and resistor; (2) Generator buses; (3) Generator surge and potential transformers; (4) Generator and feeder cubicles; (5) Feeder transfer bus; (6) Feeder cable entrance units; (7) Synchronizing reactors; (8) Synchronizing bus; (9) Duplex control board.

G-E station-type equipments provide the modern method for getting unified power station design. These standardized units readily combine into a compact, integrated system matched to your requirements. Factory assembled and tested, they provide a degree of over-all co-ordination difficult to achieve in any other way.

Standardized "packaged" units include circuit breakers, associated switching equipments and interconnecting buses. Each has been given the large investment in design time and high degree of design refinement warranted by repetitive manufacture. All are completely metal enclosed and fully co-ordinated to assure greater safety and dependability.

For complete information concerning the many advantages of G-E station-type equipments, see your local G-E sales representative, or write the General Electric Company, Schenectady 5, N. Y.

GENERAL ELECTRIC

855-28

With factories in Anaheim, Los Angeles, Oakland, Ontario, San Francisco, San Jose, Seattle, and Richland, and Sales Offices in twenty Western cities.

OCTOBER 1951

SPOKESMAN FOR MOST HIGHLY ELECTRIFIED REGION OF THE U. S.
The all-industry magazine of progress, established 1887, and incorporating the "Electrical Journal" "Journal of Electricity, Power and Gas" and "Journal of Electricity." Contents copyright. Sixty-third year of publication

VOL. 107 NO. 4

ELECTRICAL WEST

George C. Tenney, Editor
W. A. Cyr, Associate Editor — Walter C. Heston, Engineering Editor
Peggy Boyer, Assistant Editor — John Cootz, Typography

Next Month

Held over for lack of space is one of the best industrial plant articles we have had in some time. It covers electrical features of the new $25 million Lever Bros. soap plant in Los Angeles. A 480-v secondary network was used. Reasons are important to industrial designers.

Another article on distribution, this one on the utility system for serving a large housing project and shopping center, will appear.

Utility engineers will be interested in a description of the new Gadsby steam plant at Salt Lake City, the first in the West to use the reheat cycle for fuel economy.

The time-honored steam-driven headrig in sawmills has at last given way to an electric drive. An article will describe this Western development.

Use of a portable concrete mixer for transmission tower footings is something new. That will be covered.

An article on the 120/208-v 4-wire system being used in large new apartment buildings in Portland will be interesting. This system is new to residential occupancies.

Several important industry meetings are to be covered. Then there will be the information - packed sales and contractors' news letters.

CONTENTS

INDUSTRIAL

Western Power Outlook 65
- **Pacific Northwest** 66
- **Pacific Southwest** 69
- **Wyoming, Colorado, New Mexico** 74
- **Montana, Idaho, Utah** 75

Amplidyne Control for Veneer Lathe Drive
by W. D. Vincent and Fred Thompson 76

ENGINEERING

Skagit Will Be Low-Cost Hydro 78
Contra Costa Is Highly Instrumentated 81
Operations Center Is Functionally Designed 84

LIGHTING AND WIRING

Wiring a Building on the Vertical 86

SALES

All Want Another Wonderland 90
More Customer Follow-Up Advocated at IEA Meeting 92

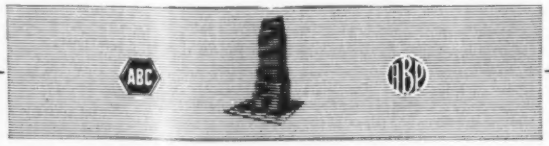
DEPARTMENTS

Associations	102	**New Products**	38
Books	36	**News**	104
Bulletins	58	**Northwest Data Sheet**	101
Contrac'ors' News Letter	95	**Profiles**	132
Editorials	88	**Sales Guide News Letter**	97
Electra's Husband	62	**Advertising Index**	132

Cover: Pacific Gas and Electric Co.'s 300,000-kw Contra Costa steam plant, located at Antioch, Calif. See story on page 81.

ADVERTISING REPRESENTATIVES

Chicago (11) ..... **Michael I. O'Connell, 520 N. Michigan Ave.**
Cleveland (5) ..... **Frank J. Seiler, 1510 Hanna Bldg.**
Los Angeles (17) ..... **Carl Dysinger, 1111 Wilshire Blvd., MA 6-4323**
New York (18) ..... **Walter Klein, 330 W. 42nd St.**
San Francisco (4) ..... **Tom Carmody, 68 Post St., DO. 2-4600**



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L-M Protective Lighting is PRODUCTIVE Lighting

Protection is only *half* the story when you install L-M plant-protective lighting.

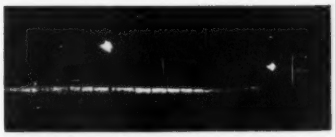
PRODUCTION, not only during the present emergency, but in the years to come, is an equally important consideration in every L-M installation.

L-M Lighting Engineers, backed by more than 35 years of experience with outdoor lighting, are designing installations which not only meet War Standards Requirements but also provide additional light on loading docks, railroad sidings, yards, storage areas, parking lots and entrances.

Dark spots are potential production-bottlenecks. They can also be scenes of lost-time accidents. By eliminating these dark areas, L-M Protective Lighting installations will continue to pay off for years to come.

No dark hideaways for intruders, even in this back alleyway. A Spherolite installation.

A lighted fence, with controlled light directed at the fence and beyond. Guards patrol roadway in semi-dark at right of picture.



Over-the-fence lighting, with glare on any approaching intruder. Typical use of L-M Fresnelite.

Two L-M Protective Lighting Units

L-M Spherolite provides 5 different light patterns. Combinations of reflectors and refractors to provide correct light pattern for almost any requirement. When equipped with L-M Autolatch, it can be serviced from ground with lamp stick; no ladder needed.

L-M Fresnelite—specially designed glare unit to provide a broad, fan-shaped light pattern. Ideal for over-the-fence lighting.

GET THIS LIGHTING BULLETIN

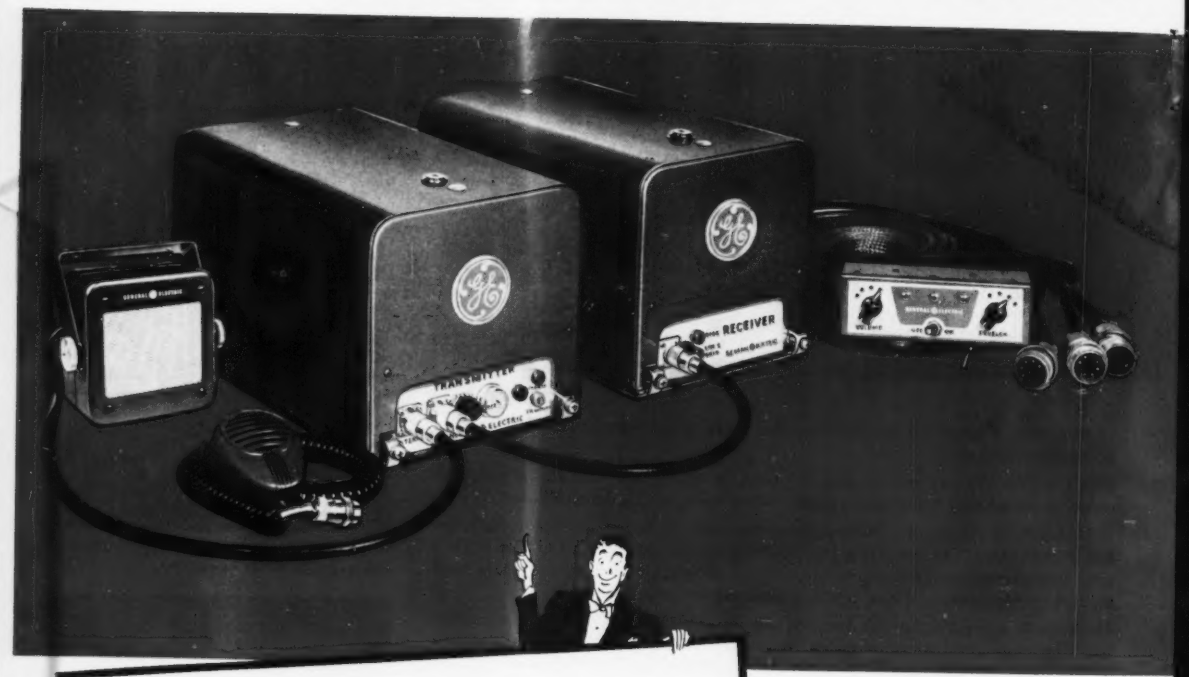
Ask the L-M Field Engineer for L-M's bulletin on Protective Lighting. Describes L-M Lighting Engineering Service and L-M Luminaires. Or write Line Material Company, Milwaukee 1, Wisconsin (a McGraw Electric Company Division).

5

LM

LINE MATERIAL...Protective Lighting

In 2-way radio G. E. MAKES MORE THAN ANY OTHER



Laboratory and field tests show G-E unsurpassed in direct comparison with the best of competition

Adjacent Channel Selectivity—This G-E equipment lets you drive "closer to the other fellow's tower" without interference.

Intermodulation Interference Rejection—In "crowded air" this feature becomes increasingly important. The G-E unit shown above was 14db better than competition on adjacent channel tests.

Desensitization—In the presence of strong adjacent channel signals, the General Electric receiver desensitizes almost 15db less than other makes.

Sensitivity—With battery voltages as low as 4.5v, the G-E receiver *still* delivers a signal—long after others have "blacked out."

Receiver Oscillator Radiation—Lowest of any yet tested—only 20 micro-microwatts!

▲ WHAT A PERFORMANCE PACKAGE—HERE'S WHAT YOU GET!

Selectivity in a class by itself—new 4-coil IF transformers . . . minimum intermodulation and high image ratio . . . sensitivity that stays up even when the battery's down . . . lower tube replacement cost and lower standby battery drain than other makes. It's the best 2-way radio performance your dollar can buy!

OF ITS COMPONENTS MANUFACTURER!

THIS is important to users of 2-way radio because it means you get a complete General Electric product from the chassis up . . . tubes, transformers, dynamotors, crystals, capacitors—all designed, engineered, and manufactured by G.E. to insure rigid quality control and a superior product.

But quality alone is not enough. More General Electric 2-way radio equipment was bought last year than in any similar period in the company's history. To meet this growing demand a new plant has been established at Utica, New York, devoted exclusively to the manufacture of our complete radio communication line.

When you buy a 2-way radio system, consider the years of service you expect to get out of it. Examine all makes—then put your money into lasting quality, backed by a name you can believe in—General Electric.

TUBES—Receiver types and transmitter types—made at G-E plants at Owensboro, Kentucky, and Schenectady, New York.

TRANSFORMERS & CHOKES—Two mighty important reasons why G-E station transmitters are rated for continuous duty cycle. Made by G.E. at Fort Wayne, Indiana.

SPEAKERS—With the famous aluminum voice coil for all-weather performance. Made at Electronics Park, Syracuse, New York.

DYNAMOTORS—Another G-E product from Fort Wayne. They're built for 100,000 starts!

PYRANOL CAPACITORS—The last word in component dependability. A G-E specialty from Pittsfield, Mass.

BEFORE YOU BUY *ANY* RADIO COMMUNICATION EQUIPMENT . . . PROVE THIS TO YOURSELF

When you have checked the feature chart at left, call the radio communication man at the G-E office near you. He will tell you more about the equipment and arrange a demonstration. Meanwhile, mail this coupon today for complete information kit.

General Electric Co., Sec. 20101
Electronics Park—Syracuse, N. Y.

Yes, send me your FREE INFORMATION KIT on General Electric 2-way radio equipment.

NAME.....

ADDRESS.....

CITY.....STATE.....

You can put your confidence in

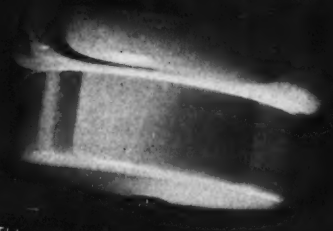
GENERAL ELECTRIC

The trend is to QUALITY in lighting equipment

ILLUMINATION EQUIPMENT
SMOOT-HOLMAN
INGLEWOOD, CALIFORNIA ®
MADE IN U.S.A.

—MEANS TOP QUALITY ALWAYS!

new

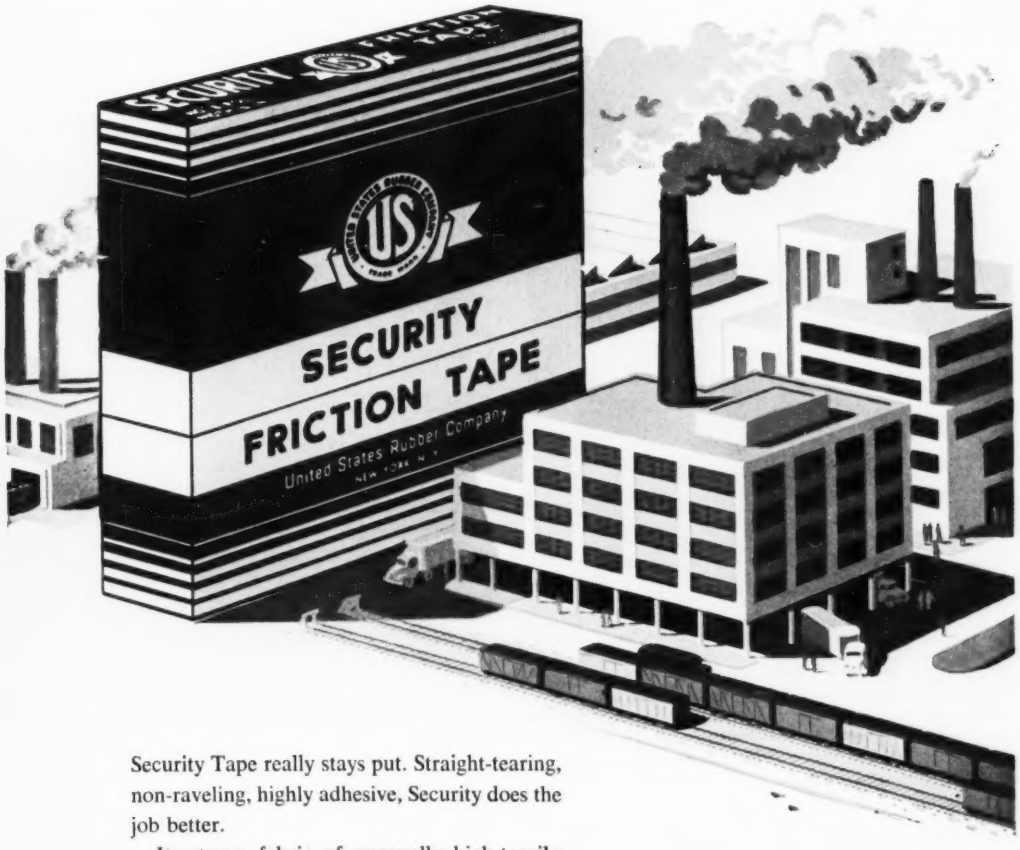


This is the new low heat Ceiling-Lite designed to comply with recent Underwriters' Laboratories requirements effective January 1, 1951. Made in three sizes —

No. LH-1110 — 10" glass
Approved for 200 Watts
No. LH-1112 — 12" glass
Approved for 300 Watts
No. LH-1114 — 14" glass
Approved for 300 Watts

SMOOT-HOLMAN COMPANY Inglewood, Calif. Offices in Principal Western Cities • Branch and Warehouse in San Francisco

a Giant in Reliability



Security Tape really stays put. Straight-tearing, non-raveling, highly adhesive, Security does the job better.

Its strong fabric of unusually high-tensile strength gives long-lasting protection.

Security has no pinholes to cause troublesome leaks…Ask your wholesaler for Security.

A QUALITY PRODUCT OF

U.S.RUBBER
SERVING THROUGH SCIENCE

UNITED STATES RUBBER COMPANY

TAPE DEPARTMENT • ROCKEFELLER CENTER, NEW YORK 20, N. Y.

This cutout is liberally designed—has high dielectric strength, uses silver-plated contacts, provides full-range interruption of fault currents, and is conservatively rated as to interrupting capacity. All live parts are completely enclosed for maximum safety.

4 CUTOUTS IN ONE

by simply changing doors

AND THAT'S ONLY HALF THE STORY! By stocking only three interchangeable doors which fit both 5.2 and 7.8 kv, 50-ampere housings, you get the 4 operating functions illustrated below—a total of eight essential cutout combinations! Available also in 100-ampere ratings, this unique flexibility reduces inventory and simplifies stocks.

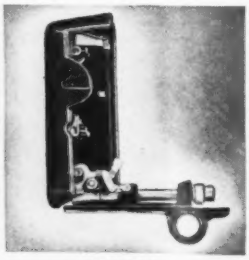
INDICATING OR DROPOUT WITH A TWIST OF THE WRIST! A small wire yoke, easily inserted or removed, determines whether the fuseholder door "kicks out" at the bottom for visual indication, or drops open—either way giving positive evidence of a blown fuse.

RECLOSING DOOR AVOIDS UNNECESSARY SERVICE TRIP! The two-element reclosing door restores service within one second after a temporary fault blows the first fuse link. By avoiding an extra service trip, the two-shot cutout pays for itself the first time it operates!

FLEXIBLE DISCONNECT BLADE CAN'T GET LOST! It's fastened to the door—can't be misplaced. This disconnect blade doubles the continuous current rating of the cutout. When the blade is disconnected and the door closed, the flexible cable extends downward to indicate that the circuit is open.

Only G.E. offers you this flexibility of cutout applications. For complete information contact your G-E sales representative, or write for Bulletin GEA-3448. *General Electric Co., Schenectady 5, New York.*

Indicating


Drop-out

Reclosing

Disconnect

GENERAL ELECTRIC

406-39

With factories in Anaheim, Los Angeles, Oakland, Ontario, San Francisco, San Jose, Seattle, and Richland, and Sales Offices in twenty Western cities.

TIGHT JOINTS

AT ALL POINTS . . . "VIA GRAYBAR"

Reliable Connectors, Splices

Graybar can supply everything your linemen need for connecting all types of lines *securely*. Two of the high-quality Reliable items we distribute are: (1) Solderless connectors—accurately cold headed. All parts are at least 98% copper, have no sharp corners, and have torque, compression, and reuse factors far above ordinary connectors. (2) Automatic splices and deadends for copper, ACSR, or steel strand—now filled with non-corrosive grease and packed to stay in perfect condition.

O-B INSULATORS

In these days of overloaded distribution systems, no line is stronger than its insulators. Graybar supplies superior-quality Ohio Brass insulators in strain, pin, and suspension types.

ONE SOURCE FOR ALL

For both transmission and distribution lines, Graybar has everything "from the bottom of the hole to the top of the pole"! By ordering all your pole-line needs from this single source, you save time and paper-work expense. You get the leading lines of poles, crossarms, insulators, hardware, strand, line trucks and tools. And you get them the quickest way possible — delivered wherever you specify.

Men who know your needs

When you call on Graybar, for supplies or for information, you can expect us to meet your needs both promptly and accurately. That's because Graybar has been familiar with your needs ever since the first lines went up. You're welcome to the help of the near-by Graybar Outside Construction Specialist in planning any pole-line or underground project. *Graybar Electric Company, Inc. Executive offices: Graybar Building, New York 17, N. Y.* 107-810

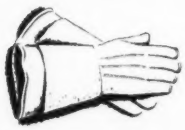
IN OVER 100 PRINCIPAL CITIES

CLEAN INSTALLATIONS. Individually mounted or grouped, wye or delta, whatever your standard wiring practice may be, you'll find it easy to design cleaner, safer installations with the new Westinghouse "CSP" Transformers.

Put Yourself ON THE SPOT

Where clearance means SAFETY

Put yourself in these shoes, high on a pole top where clearance means safety. That's where you'll appreciate the new Westinghouse "CSP"® Transformers with wall-mounted, high-voltage bushings that give you better working clearance—where they eliminate long loops that swing dangerously in the wind.

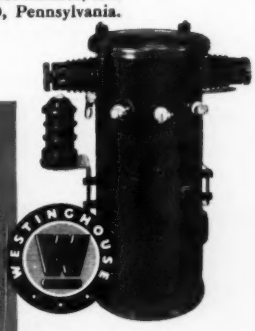


Try on these gloves, and you'll agree that it's important to have a large insulated knob to make hand-tightening easy, eliminating the need for tools.

Now back to the desk, where statistics talk best. Your own figures* can show you it's good business to standardize on "CSP" Transformers . . . to take advantage of this lower installed cost, better service continuity. Extra features like "Coastal Finish", bushings with unbreakable Enrup† knobs, and Wemco C-I (inhibited) Oil make it pay to specify Westinghouse "CSP" Transformers. J-70588

*If you have not yet made the detailed analysis of initial, installed and maintenance costs of "CSP" Transformers on the basis of *your own figures,* ask your Westinghouse representative for a copy of the check chart, B-4247B, "Transformer Costs and Their Relation to Profits". He'll be glad to give you details on the new product features, too. Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania.

†T. M. Reg. U. S. R. Co.



YOU CAN BE SURE.. IF IT'S

Westinghouse

"CSP" DISTRIBUTION TRANSFORMERS

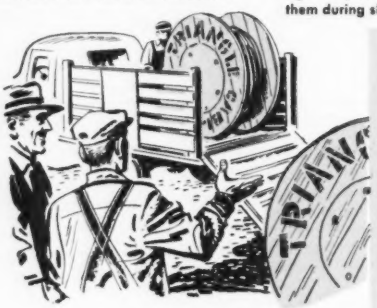
Plants at Berkeley, Calif.; Sunnyvale, Calif.; Emeryville, Calif.; Los Angeles; Portland; Salt Lake City; Seattle; Denver.

I told the boss it was Clean as a Whistle!

It was a big atomic energy job and we wanted everything to be just right. "Is this stuff clean?" asks the boss, eyeing a rack of conduit. I told him it was Triangle and *it had* to be right but he wanted to see for himself. "Good—no burrs, no rough spots and it's hot-dipped galvanized. That's the kind of conduit I like to see."

I figured while I had him in a good mood, I'd give him the rest of the story. "See how easy it bends, nice and even all around and there's no flaking on the bends. You never get any broken threads either because Triangle makes conduit and couplings the right way and the threads are capped to protect them during shipment."

I took him over to where we were doing some branch circuit work. "Pulling wire is a cinch with Triangle's Glazon. That slick braid sure helps to do the trick. Glazon seems to be extra tough, too. Stands up better than anything we've ever used."



The boss asked me what kind of service I was getting and I told him, "Triangle and their distributors have never let me down. I don't have to go chasing after their salesmen. They check up on deliveries to see that we get the material on the job when we need it and are always glad to help me in any way they can."

The boss doesn't say much but he walks off with a smile on his face. Whether you're the boss or the guy on the job, take a tip from me—

ASK YOUR ELECTRICAL DISTRIBUTOR— HE KNOWS—

It MUST Be Right

THE TRADE-MARK OF TOP QUALITY!

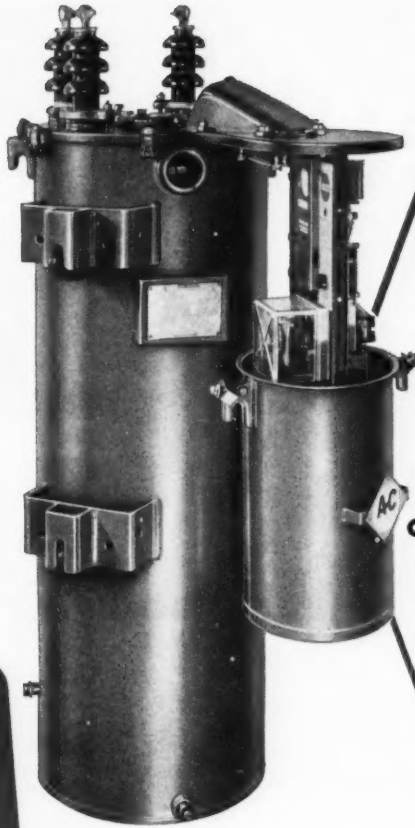
TRIANGLE CONDUIT & CABLE CO., INC.

NEW BRUNSWICK, NEW JERSEY

IT *MUST* BE RIGHT

"Glazon" Building Wire • Glazon" Non-Metallic Sheathed Cable • Armored Cable • Service Entrance, Service Drop, Varnished Cambric Braided or Leaded, Trioprene Trench, Power and Parkway Cables • Bare Wire • Rigid Conduit Hot Dipped Galvanized • Electric Metallic Thin Wall Conduit • Flexible Steel Conduit

NEW 50 Amp Rating



20% Range of Regulation

±1 Volt Band

Raises KWH Consumption

Increases Customer Goodwill

ALLIS-CHALMERS 5/8% STEP VOLTAGE REGULATOR

YOU CAN PROFIT from Allis-Chalmers 5/8% step regulation in the new larger rating of the 50 ampere JFR regulator. Its low price tag holds original equipment cost down . . . makes regulation even less expensive than before . . . and gives you all the advantages of the Allis-Chalmers 5/8% step regulator line.

This means you can increase KWH consumption — and revenue, cut complaints, and increase customer goodwill. That's because Allis-Chalmers 5/8% Step Regulators hold a ± 1 volt band — give you close, accurate regulation over a 20% range.

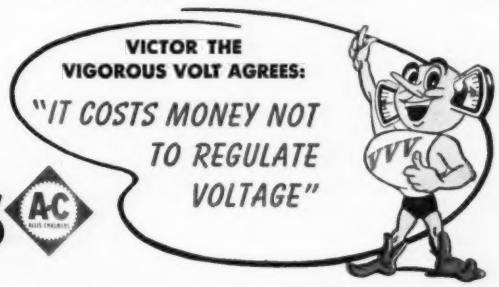
Simple Adjustment

The new 50 amp JFR regulator is fully automatic in a rating of 38.1 kva, 7620 volts, 50 amp for operation at 7960, 7200, 6900, 5000, 4330, and 2500 volts. It has a unit type control grouped on a single panel to make maintenance and adjustment easy. Only two knob settings are needed. Voltage level and voltage band can be set in less than 60 seconds.

Jump-Proof Mounting Brackets

The jump-proof mounting brackets on the new 50 amp JFR Regulator are the same as used on distribution transformers. A heavy driving motor operates under oil for tap changing. There are no commutators, slip rings, brushes, no centrifugal switch.

You are losing revenue every day you wait to correct low voltage. Call your nearest Allis-Chalmers district office today for information on how the 50 amp JFR regulator can cut your regulation costs and improve service. Or write: Allis-Chalmers, Milwaukee 1, Wisconsin. A-3393



ALLIS-CHALMERS

Originators of 5/8% Step Regulation

YOU* ASKED FOR IT!

....SO

National Electric developed

SURFACEDUCT

"We need a small, all-purpose electrical raceway . . ."

". . . for flexible lighting arrangements"

"No fishing . . . Unobstructed wiring channels"

"Low cost . . . Low Maintenance . . ."

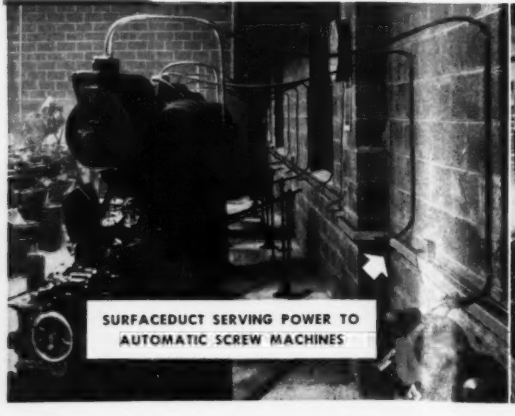
"Safe . . . Light . . . Strong"

"Easily installed . . . Completely accessible . . ."

". . . electrical modernization"

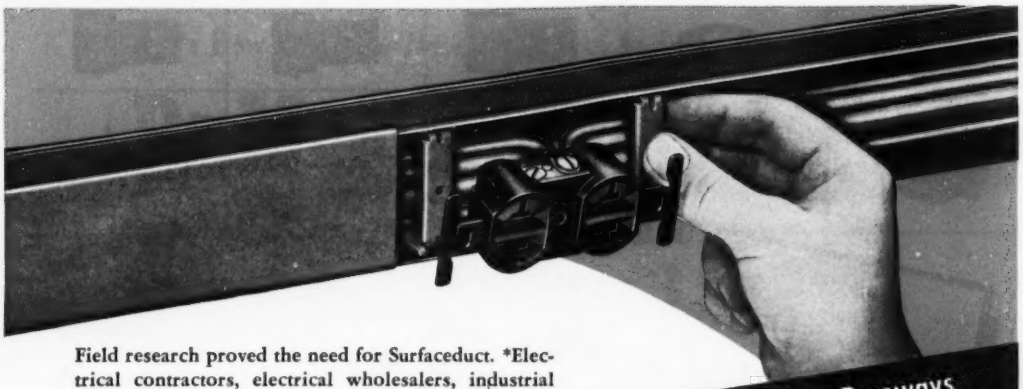
"Easily rerouted . . . Minimum of fittings . . ."

Pioneering is Simply Doing the Obvious FIRST



SURFACEDUCT SERVING POWER TO AUTOMATIC SCREW MACHINES

SURFACEDUCT LIGHTING AND POWER APPLICATION

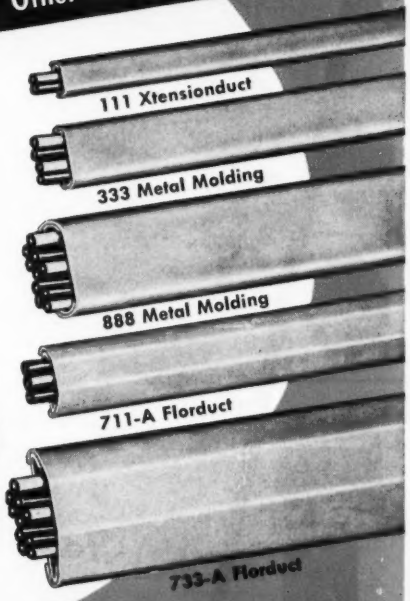


Field research proved the need for Surfaceduct. *Electrical contractors, electrical wholesalers, industrial engineers, plant maintenance men, architects—all told us what they wanted in a general purpose electrical raceway system.

Surfaceduct was designed in strict accordance with the advice and suggestions of these men in the electrical field who were to install or specify it. The engineering "know-how" National Electric had attained as pioneer manufacturer of surface raceways took Surfaceduct from the blueprint stage to production and on to an enthusiastic reception by the electrical trade.

Today, only six short years after its introduction, Surfaceduct is efficiently serving electrical applications requiring light or power up to 60 ampere service. Surfaceduct is another versatile product of National Electric, the world's largest producer of the *complete line* of secondary electrical distribution systems.

Other NE Surface Raceways



EVERYTHING IN WIRING POINTS TO

National Electric
PRODUCTS CORPORATION

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SURFACEDUCT ON BENCHES

SURFACEDUCT IS EASY TO INSTALL . . . EASY TO REROUTE . . . COMPLETELY ACCESSIBLE

Another Star for the Complete RACO Line

They're really anchored with the RACO S.B.S.!*

Here's a Switch Box Support* that will hold *any* switch box in place. It can be used with all types of wallboard. It provides a strong, firm mounting. Switches (and particularly receptacles) will stay put. No loose parts to get lost in the walls, either. This is another example of the Raco design engineering and construction that keep Raco at the top of the list.

You can always rely on RACO

RACO

ALL-STEEL EQUIPMENT Inc.—800 Kensington Ave., Aurora, Illinois

"A BOX FOR EVERY NEED"

Here's How You Save Time, Money . . . And Reduce Inventory

RoMarine - RoPrene®

ALL-PURPOSE POWER CABLE

1 CABLE THAT CAN BE USED 3 WAYS

Gone are the days when you had to buy one cable for direct burial, another for installation in ducts, and still another for aerial service. Rome's famous RoMarine-RoPrene all-purpose power cable can be used in any one of these ways . . . or can be installed in circuits combining all three. As a result, you save time and money, reduce expensive inventories and conserve scarce copper.

RoMarine-RoPrene has a specially compounded rubber insulation (RoMarine) designed to withstand extreme heat and moisture. The tough, easy-pulling RoPrene (Neoprene) sheath resists flame, moisture, acids, alkalies, oils and abrasions. Suitable for continuous operation at 75° C., RoMarine-RoPrene is recommended for services up to 5000 volts.

Simple to splice and tap, flexible at low temperatures, it's a lightweight, easy-to-handle power cable. What's more, it can be terminated with manual connections, eliminating the necessity of potheads or stress cones. RoMarine-RoPrene has proven excellent for secondary network circuits, underground entrances, street lighting, station control, industrial power systems and many other direct burial, conduit and aerial installations. For complete information, send the coupon below.

Underwriters approved as Type USE. Accepted by leading utilities and industrials. CAA approved for airport lighting under Specification L-824.

Copper wire mill products are a Controlled Material under N.P.A. Controlled Materials Plan. USE YOUR CMP ALLOTMENT.

It Costs Less to Buy the Best

ROME CABLE CORP., Dept. W-10, Rome, N. Y.
Please send copy of new Rome Power and Control Cable Catalog.

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Wagner
TRANSFORMERS
...the choice of leaders
in industry

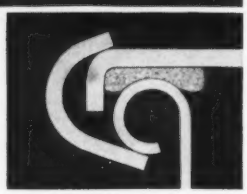
3 REASONS WHY

Wagner
Form W TRANSFORMERS
pay dividends in Extra Service

Wagner maintains 31 branch offices in principal cities for quick, convenient engineering service. Consult the nearest branch on your next transformer installation.

1 SHUR-SEAL COVER

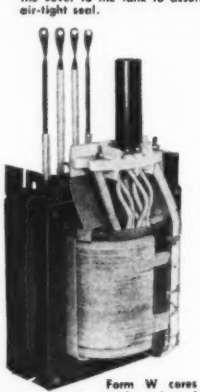
The new method of fastening the cover to the tank that provides true sealed tank construction. "Breathing" is prevented and no leakage of oil can occur. The SHUR-SEAL Clamping Ring maintains equal pressure *all around* the cover —yet permits easy removal of the cover by loosening a *single* stainless steel bolt.



The V-shaped cross section SHUR-SEAL Clamping Ring securely locks the cover to the tank to assure an air-tight seal.

2 IMPROVED CORE AND COIL DESIGN

Form W elements, with preformed cores of cold rolled, oriented grain steel permit the construction of small size, light weight, yet liberally designed transformers. Form W Transformers give excellent electrical performance – core and copper losses are low . . . short time overload capacity is high.



Form W cores are preformed and assembled in rectangular shape to provide a path for the magnetic flux parallel to the grain of the steel.

3 BUILT TO GIVE EXTRA VALUE

Wagner Form W Transformers are built the Wagner way—with the use of only the highest quality materials, carefully controlled production methods, and the skill acquired in sixty years of transformer building experience. That's why they pay dividends in longer service life.

Wagner Electric Corporation 1891 WE 1951

WAGNER ELECTRIC CORPORATION
6381 Plymouth Ave., St. Louis 14, Mo., U.S.A.

ELECTRIC MOTORS • TRANSFORMERS • INDUSTRIAL BRAKES
AUTOMOTIVE BRAKE SYSTEMS – AIR AND HYDRAULIC

BRANCHES IN 31 PRINCIPAL CITIES

TM-9

your plant is as OLD as its wiring system!

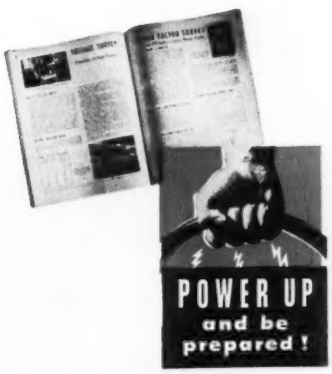
ANACONDA "POWER UP"
CAMPAIGN HELPS UTILITIES
HERE IS another advertisement in the Anaconda "POWER UP — And Be Prepared" campaign urging industry to make more efficient use of the power it buys from you. This Anaconda campaign is also being directed to contractors and wholesalers.
As in our previous industry-wide campaigns, we again offer advertisement reprints, imprinted with your letterhead and message —for mailing to your industrial power customers.

You can have the newest and best machinery money will buy; you may have the newest in modern plant design—but if your wiring system is obsolete you still have an old plant.

Fast-moving, full-scale production is being stymied in 9 out of every 10 industrial plants by overworked, obsolete wiring systems.

Now more than ever, you should be utilizing all the power you pay for. A dependable, up-to-date wiring system eliminates power breakdowns, lost man-hours . . . and adds strength to our national production.

Determine the condition of your plant wiring system today. Call in your utility, plant or consulting engineer or electrical contractor and arrange to have him survey your plant. And, most important of all, send for your free copy of *"Power Up—And Be Prepared."* This complete modern wiring guide shows you how efficient wiring systems cut down expenses and build up your power efficiency. Anaconda Wire & Cable Company, 25 Broadway, New York 4, N. Y. 81399



the right cable for the job

ANACONDA®

WIRE AND CABLE

PLP Dead-Ends+

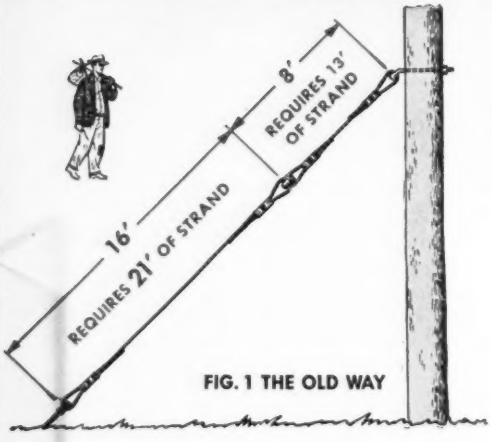
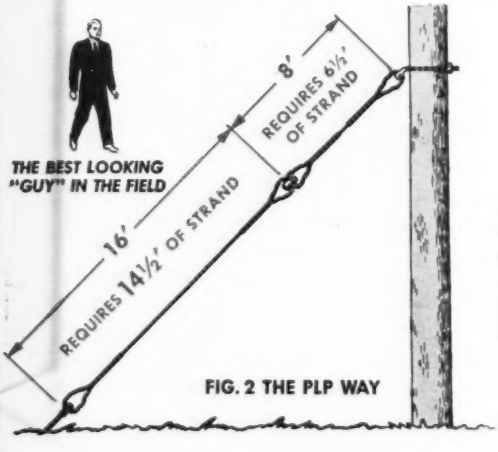


FIG. 1 THE OLD WAY



THE BEST LOOKING "GUY" IN THE FIELD

FIG. 2 THE PLP WAY

With PLP Dead-Ends, you save critical guy strand and get stronger, safer guys. For example, let's consider the 24-foot, 6000# guy (Fig. 1). Doing the job in this conventional way, using Siemens-Martin Strand, requires:

13′ of ⅜″ strand (TS 6950#)
weighing 273#/1000′ = 3.549 lbs.

21′ of ⅜″ strand (TS 6950#)
weighing 273#/1000′ = 5.733 lbs.

9.282 lbs.

But the equivalent PLP Dead-End installation (Fig. 2) using 3-wire Extra High Strength strand, requires only:

6½′ of ¼″ EHS strand (TS 6600#)
weighing 116.7#/1000′ = 0.759 lbs.

14½′ of ¼″ EHS strand (TS 6600#)
weighing 116.7#/1000′ = 1.692 lbs.

2.451 lbs.

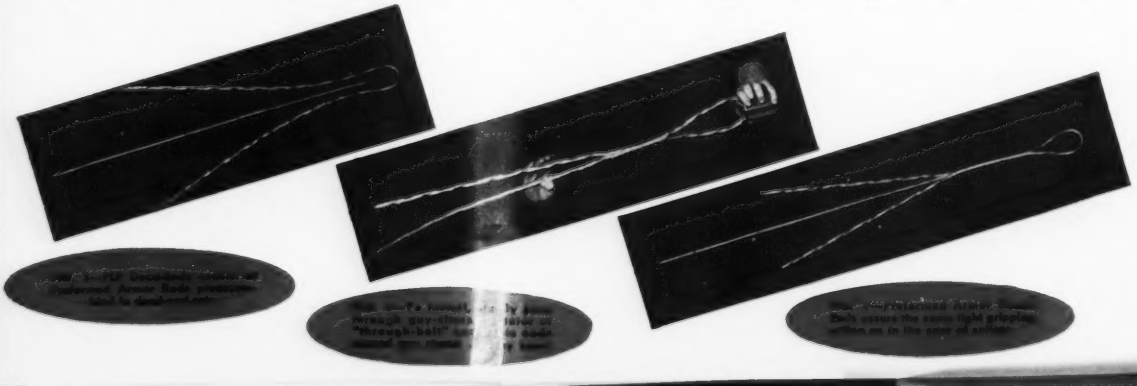
SAVING --- 6.831 lbs.

Making this Guy the PLP way results in a saving of 73% of critical guy strand . . . and you eliminate the need of any clamps.

With PLP Dead-Ends, even wrenches are not needed. Simply install by hand! (Fig. 4) Any lineman . . . regardless of his skill . . . can do a perfect job every time. *Installation time is cut in half.*

Substantial dollar savings are the result even with "B" and "C" coated strand.

And PLP Dead-Ends are stronger than the strand. *See opposite page.*



= 73% Saving of Guy Strand

STRAND STRENGTH EXCEEDED by PLP DEAD-ENDS

Recently, one of the best known electrical laboratories tested the static strength and the d-c resistance* of various splices and dead-ends. The engineers found one system far better than the rest. So much better that you will want to see their testing procedure and test results.

HERE'S WHAT THEY DID

7-STRAND CONDUCTOR
FIG. 6

They took two sections of 7/16", 7-strand extra high-strength galvanized steel (catalog strength: 11,200 lbs.)

SPLICE
FIG. 7

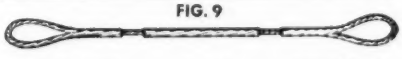
Spliced them together, *by hand*, with *Preformed Armor Rods*.

*Name on request

DEAD END
FIG. 8

Then attached dead-ends of *Preformed Armor Rods* to both ends . . . using no tools, clips or clamps.

FIG. 9



DEAD END SPLICE DEAD END

Placed the specimen in a tensile testing machine. Measured the d-c resistance (through both dead-ends and the splice) under no load and under loads up to 5000 lbs. Continued loading until the specimen failed. Compared these results with an unbroken conductor of equal length.

HERE'S WHAT THEY FOUND

Preformed armor splices and dead-ends averaged at least 40% more conductivity than the unbroken cable every time the test was made.

Preformed armor splices and dead-ends proved stronger than the unbroken conductor. Breaks always occured in the section not protected by the *Preformed Armor Rods* . . . at about 10% more than the rated strand strength of 11,200 lbs.

* The use of Preformed Armor Rods for making better guys, is just one of the many applications of these revolutionary new rods. Utilities throughout the country are finding that they are invaluable for support armor, repair armor, splices, jumpers, ground strand armor, tie wire, dual-conductor spacers, lashing armor, dampers and suspension clamp jumpers. For complete information regarding any or all of these applications, just write to: PREFORMED LINE PRODUCTS COMPANY, 5349 St. Clair Avenue, Cleveland 3, Ohio.

PREFORMED

LINE PRODUCTS CO.

CLEVELAND 3, OHIO

PARKWAY CABLE

Photo courtesy of Barber-Greene Company

For economical, direct-in-the-ground burial

YOU'LL CUT EXPENSE to the minimum by adopting Roebling Parkway Cable for distribution and general power supply circuits. This cable is buried directly in a shallow, economical trench . . . and assures you dependable, maintenance-free service year in, year out.

Roebling Parkway Cable is made in single and multiple conductor — solid or stranded — in a range from 600 to 5,000 volts. Furnished with metallic armor or non-metallic ROEPRENE sheath, depending upon the amount of physical protection required.

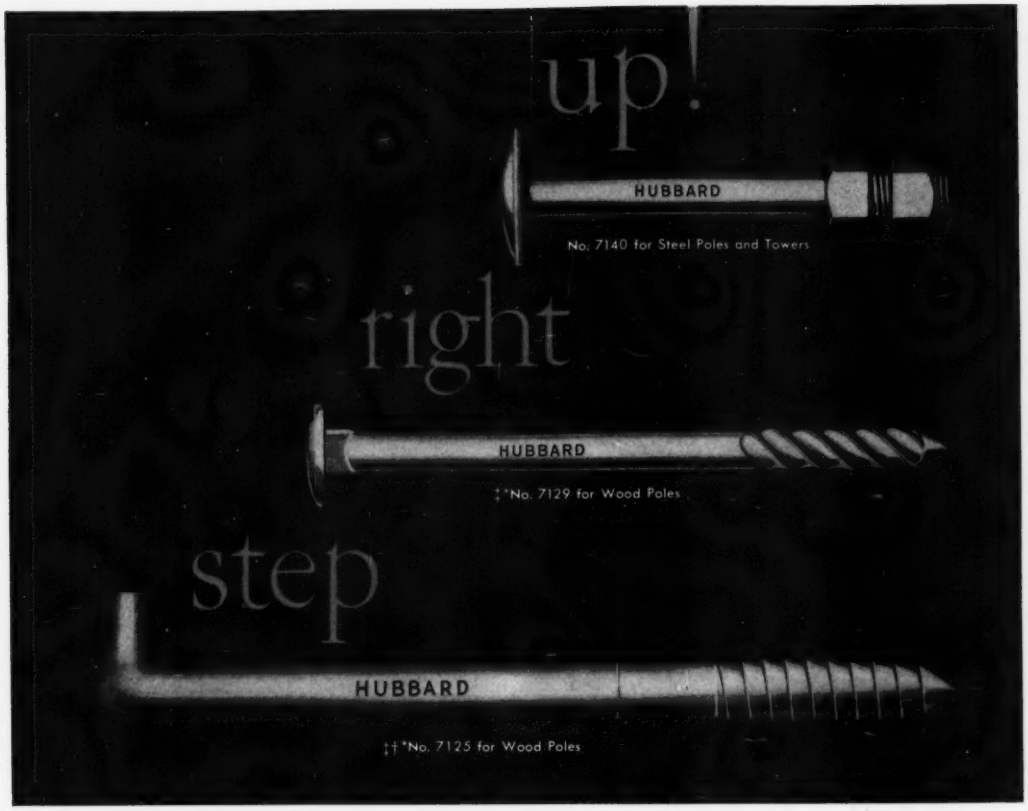
C. A. A. Approved for Airport Lighting

Roebling Type A cable for 600 volts, and Type B for 3,000 and 5,000 volts, pass all C.A.A. requirements for Specification No. L-824. Both types are made in single and multiple conductor construction. Type A has RP insulation; the insulation of Type B is ozone-resistant oil-base rubber.

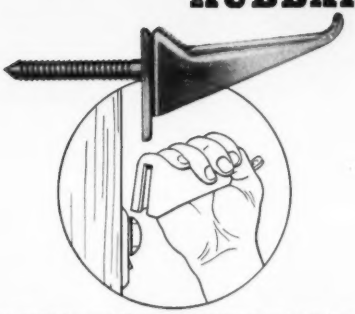
Large quantities of Roebling's full line of electrical wires and cables are called for in the national rearmament program. The Roebling organization and distributors will always, however, give you the best service and deliveries within their power. John A. Roebling's Sons Company —San Francisco—Los Angeles—Seattle.

ROEBLING

Atlanta, 934 Avon Ave ★ ***Boston,*** 51 Sleeper St ★ ***Chicago,*** 525 W. Roosevelt Rd ★ ***Cincinnati,*** 3253 Fredonia Ave ★ ***Cleveland,*** 701 St. Clair Ave, N.E. ★ ***Denver,*** 4801 Jackson St ★ ***Detroit,*** 915 First Building ★ ***Houston,*** 6216 Navigation Blvd ★ ***Los Angeles,*** 216 S. Alameda St ★ ***New York,*** 19 Rector St ★ ***Odessa, Texas,*** 1920 E. 2nd St ★ ***Philadelphia,*** 230 Vine St ★ ***San Francisco,*** 1740 17th St ★ ***Seattle,*** 900 1st Ave, S. ★ ***Tulsa,*** 321 N. Cincinnati St ★ Export Sales Office, ***Trenton, N. J.***



HUBBARD POLE STEPS...



No. 7235 Lag and Plate and No. 7236 Detachable Step are designed to prevent unlicensed climbing. The plate is slipped over the head of the lag and is prevented from turning by a lug in the lower part of the plate.
‡A.A.R. Std. *Western Union Std. †E.E.I. Std.

DESIGNED FOR SAFETY

Hubbard Pole Steps are designed to carry the heaviest human load and to withstand all normal conditions in use, with an ample safety reserve. They are forged from new Open Hearth Steel and bend tests are made periodically, after galvanizing, to check malleability and freedom from embrittlement. All Hook Head Steps have fetter drive threads and marking rings, which indicate proper installation depth and provide a tight seal against water seepage. See Hubbard Catalog No. 50, page 42, for the full line of Hubbard Steps for wood and metal poles, towers and concrete poles.

HUBBARD AND COMPANY
ESTABLISHED 1843
PITTSBURGH • CHICAGO • OAKLAND, CALIFORNIA
"Hang the Load on Hubbard Hardware!"

Here it is... CIRCUIT BREAKER PROTECTION AT FUSE BOX PRICES!

Stab-lok...

*Registration applied for.

"BIGGEST business opportunity in years!" "Outmodes practically all of today's popular fusible devices!" "Safest, most convenient circuit protection at unbelievably low cost!" "No better breaker at any price!"... That's what they're saying about the new STAB-LOK . . . and here's why:

The STAB-LOK System is simplicity itself. It consists of individual STAB-LOK Circuit Breakers and only 9 STAB-LOK Enclosures. By snapping breakers of the required ampere ratings into the right-size enclosure you can meet practically any circuit protection requirement in seconds.

Not only is the Federal Noark individual pole STAB-LOK System the most flexible and convenient, it is also the most economical ever devised. STAB-LOK enables you to get circuit breaker protection at fuse box prices.

Federal Electric Products Company, 50 Paris Street, Newark 5, New Jersey.

101
Surface Enclosure Capacity: 1 single pole Stab-lok Breaker

102
Surface Enclosure Capacity: 1 double pole or 2 single pole Stab-lok Breakers

112 S and F
Surface and Flush Capacity: 2 singles for 2-wire . . . or 2 single or 1 double pole for 3-wire connections

NBS310L
Flush-Surface Enclosure. Capacity: 10 single . . . or 4 double and 2 single pole Stab-loks

104
Flush-Surface Enclosure. Capacity: 4 single . . . or 1 double and 2 single pole Stab-loks

108
Flush-Surface Enclosure. Capacity: 8 single . . . or 2 double and 4 single pole Stab-loks

116
Flush-Surface Enclosure. Capacity: 16 single . . . or 2 double and 12 single pole Stab-loks

NBS320L
Flush-Surface Enclosures. Capacity: 20 single . . . or 10 double pole Stab-lok Breakers

FEDERAL NOARK

Complete line of Federal Electric Products includes Motor Controls, Safety Switches, Service Equipment, Circuit Breakers, Panelboards, Switchboards, Control Centers, Bus Duct ★ Sales offices in principal cities.

For transformers...
inhibited oil
or non-inhibited oil

Manufacturers say **INHIBITED**

At the October 1950 meeting of the Edison Electric Institute in New York, leading manufacturers of electrical equipment announced their intention to switch to oxidation-inhibited oil for transformers, switchgear and other equipment manufactured by them.

Experience of users says **INHIBITED**

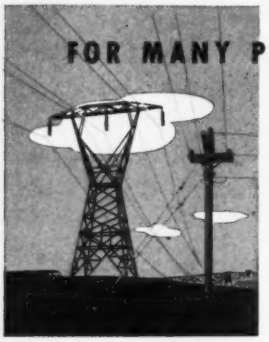
Southern California Edison Co., Los Angeles Department of Water and Power, San Diego Gas & Electric Co., Central Arizona Light and Power Co.—these and many other big users have switched to inhibited oil. They have done so because tests in their own equipment proved: that inhibited oil will last many times longer than conventional oil, due to the improvement in oxidation resistance; that inhibited oil helps to prolong the life of the equipment itself because it guards against deterioration of insulating fabrics and other materials; *that transformer maintenance costs are much lower due to the all-around superiority of inhibited oil.*

and here is the **most widely proved inhibited oil** for transformers

- **Introduced in 1946—first of its type**
- **After 5 years of use under some of the most severe operating conditions, it's still "like new" (in the same installations, conventional oils deteriorated badly in two years)**
- **On its record to date, service life estimated at up to 50 years**
- **All-around superiority proved by experience of leading power companies**
- **Suitable for voltage regulators, circuit breakers, and oil-filled bushings and switches**

SHELL DIALA OIL AX

COPPER IS VITAL TO NATIONAL SECURITY — CONSERVE IT



FOR MANY POWER APPLICATIONS

IT TAKES LESS COPPER TO DO THE JOB--

WHEN YOU USE Copperweld TRADE MARK CONDUCTORS

COPPER WIRE 100% COPPER

COPPERWELD WIRE 40% COPPER

MANY TONS OF COPPER CAN BE SAVED

BY USING COPPERWELD CONDUCTORS IN PLACE OF OVERSIZED COPPER CONDUCTORS TO OBTAIN MECHANICAL STRENGTH

—AND YOU GET GREATER STRENGTH!

Copperweld* Power Conductors are known for their dependable service and low overall costs. And, they save precious copper because they use only enough of it to do the job that copper does best — conduct electricity and resist corrosion. Copperweld's tremendous strength eliminates the need for using oversized copper conductors sometimes installed to obtain necessary mechanical strength.

Because Copperweld Power Conductors are built to last, you can be sure of their efficient, trouble-free performance . . . in all kinds of weather, in every climate—year after year. You can string longer spans—save on poles, hardware and accessories—and reduce construction costs all along the line.

Power is the very heart of our industrial effort. To do this important job use Copperweld and get the best in conductors. And, by doing this, you'll save many tons of copper. Write today for the Copperweld Engineering Data Book.

*Trade Mark

COPPERWELD SAVES COPPER

COPPERWELD STEEL COMPANY Glassport, Pa.

Pacific Coast Office: Monadnock Building, San Francisco

Copperweld TRADE MARK DEPENDABLE POWER CONDUCTORS

MADE BY THE EXCLUSIVE COPPERWELD MOLTEN-WELDING PROCESS

Lowers Operating Costs

Steps up crew efficiency!

Powers-American bodies do their job faster, more efficiently, and at lower cost, because they're "*job-engineered.*" Each model incorporates design features *proved* by utilities over many years of operation, and is field-tested under actual working conditions by utility engineers *before* production! "*Job Engineered*" means long life and trouble-free service for you, whatever your utility body needs may be. Look to *Powers-American* as *your 1* source for *all* types of utility bodies and equipment.

HYDRAULIC TOWER
Available in models having ground-to-platform heights of 21', 25', and 30', for installation on chassis having 1½ ton capacity or more.

GENERAL SERVICE BODY
½, ¾, 1, and 1½ ton models. Can be equipped to meet any operating requirement.

FORESTRY BODY
For tree trimming and clearing. Also available with winch and derrick for construction work.

REVOLVING AERIAL LADDER
Can be extended to any length, spotted in forty positions throughout a full 360° revolution, and inclined at any angle from 30° to 75°. Easily operated by one man. Safe enough to support 4 times normal working load. Available in sizes having ground-to-platform heights from 23' 6" to 32' 3".

"The Accepted Standard with Utilities Everywhere"

LIGHT CONSTRUCTION BODY (350)
Fold-over derrick can handle poles up to 40' in length. Underfloor winch leaves loading area clear.

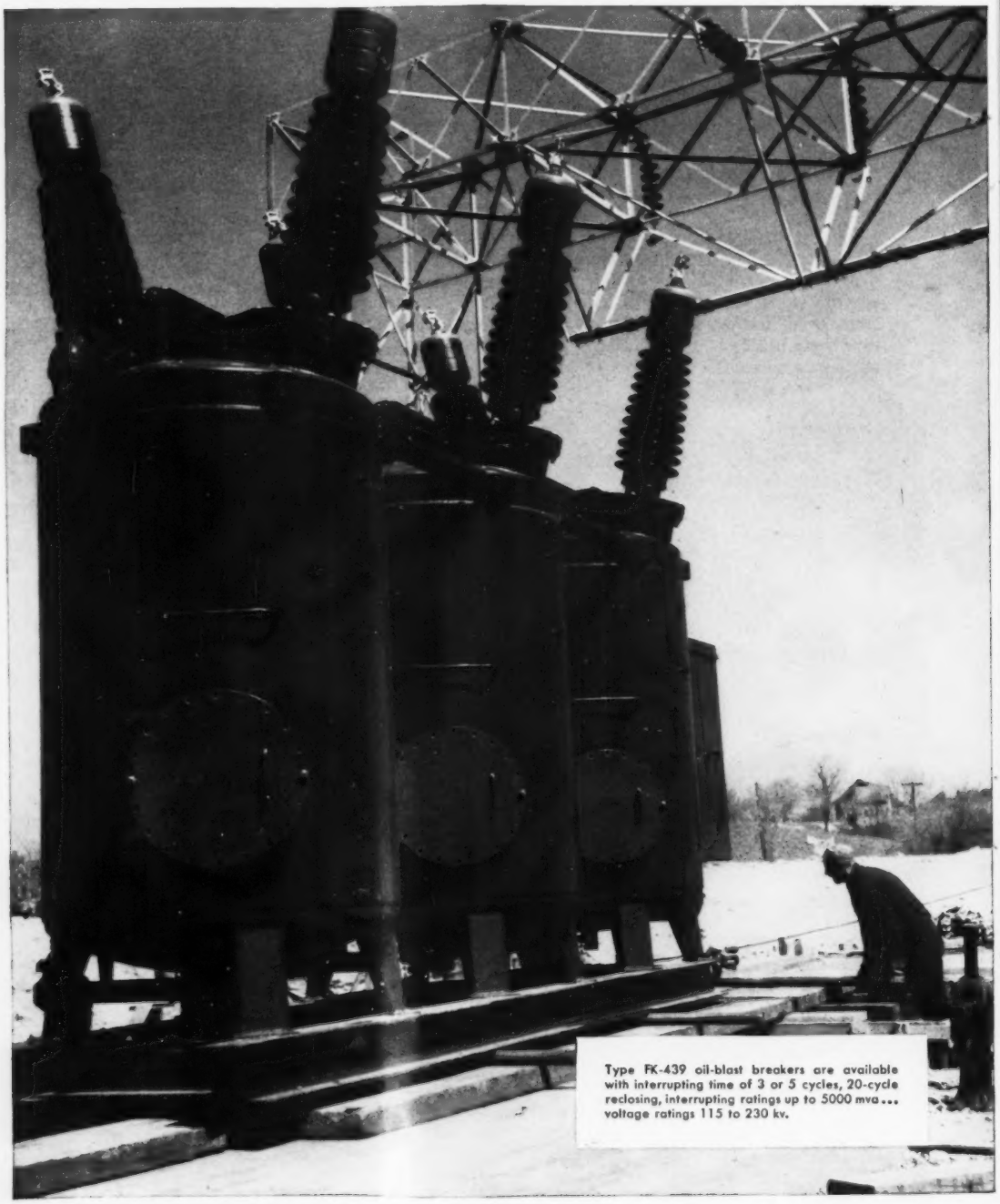
POWERS *American* DIVISION
AGB

PUBLIC UTILITY BODIES AND EQUIPMENT

McCABE-POWERS AUTO BODY COMPANY
432 Fifth Street, Oakland 7, California

There are many styles of *Powers-American* Bodies not shown here. Write for descriptive catalog today.

Central Hudson Gas and Electric



Type FK-439 oil-blast breakers are available with interrupting time of 3 or 5 cycles, 20-cycle reclosing, interrupting ratings up to 5000 mva... voltage ratings 115 to 230 kv.

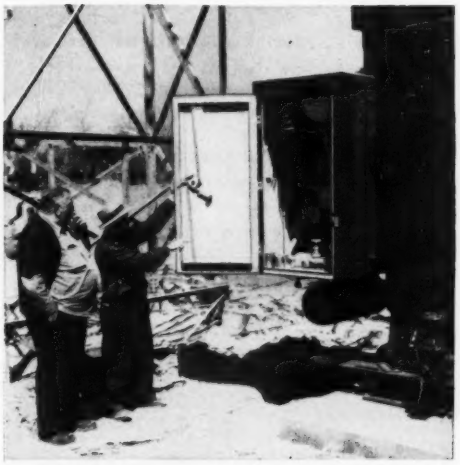
adds 33,000 kva of capacity

Type FK-439 oil-blast breakers protect new 110-kv system

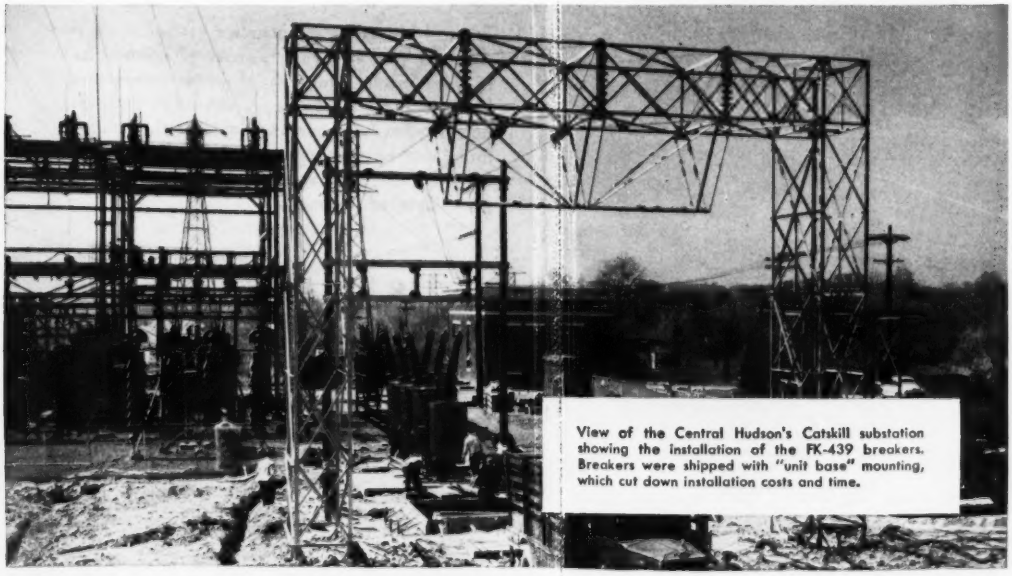
Recently Central Hudson Gas and Electric Corporation embarked on an expansion program to add 33,000 kva of capacity to its Catskill substation. Since plans called for changing high-line voltage from 66-kv to 110-kv, new circuit breaker equipment was necessary.

Company officials chose G-E Type FK-439 oil-blast breakers to protect the new installation. Multi-break interrupters and a dependable pneumatic operating mechanism provide high-speed performance and operating economy. Completely sealed bushings and accessibility of all internal parts simplify inspection and maintenance. Breakers were shipped with "unit base" mounting, which cut down installation time and expense.

Investigate these and the many other economic advantages to be realized when you use G-E switchgear on your system. Ask your G-E sales representative for further information on the FK-439 breaker, or write for Bulletin GEA-4407B, General Electric Company, Schenectady 5, N. Y.



Pneumatic operating mechanism is easily accessible. All working parts have an adequate margin of strength for safety and durability. Thoroughly tested and proved, built for dependable performance and operating economy.



View of the Central Hudson's Catskill substation showing the installation of the FK-439 breakers. Breakers were shipped with "unit base" mounting, which cut down installation costs and time.

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859-13

With factories in Anaheim, Los Angeles, Oakland, Ontario, San Francisco, San Jose, Seattle, and Richland, and Sales Offices in twenty Western cities.

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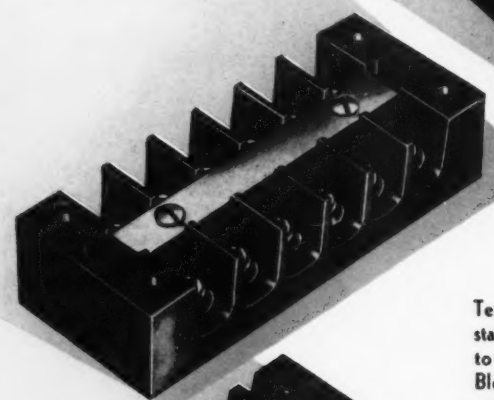
10 Styles . . . for all applications. Each available in many wire sizes; 2 to 12 wires. Molded bakelite blocks, cured under high pressure, assuring uniform density and freedom from flaws.

SERIES 1000 . . . for Space Economy. Due to extreme compactness combined with heavy duty rating, these are the most popular terminal blocks. Shown at right, actual size. Rating 30 amp. 750 v. Simple connector—no special terminal, no looping of wires.

Clamp type Connector, used with Series 1000 (above)



SERIES 6000, second only to the Series 1000 in popularity. Higher short time ratings are obtainable by adding jumper bars. Overall dimensions are same as for the Series 2000 and 3000, making it easy to combine these types. (15% wider than the Series 1000, and averaging 50% longer).

Terminal blocks for any standard control wiring installation, plus an infinite number of combinations to meet special problems of wiring connections. Blocks with center barriers . . . with single or double pole switches, for frequent sectionalizing . . . equipped for front-of-board mounting . . . with shorting strips, hinged covers, other accessories. Write for Catalog, giving detailed information.

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High-Lights

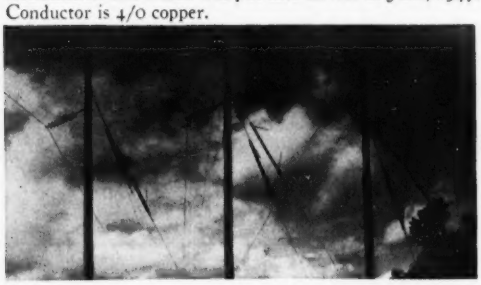
VIRGINIA ELECTRIC & POWER CO.
CONTINUING CONSTRUCTION PROGRAM

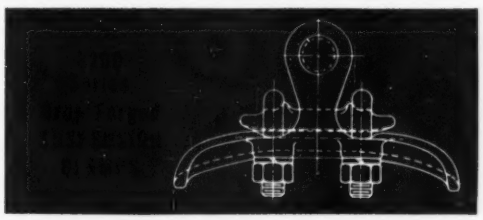
Across The James River. This 110 kv steel tower transmission line extends some 7 miles from Bremo Power Station near Bremo Bluff, Va., interconnecting with another utility to the west. Conductor is 397,500 CM ACSR. Line was placed in service August, 1950. Both this line and the line below were engineered and constructed by Stone & Webster Engineering Corp.

These lines — both of them built within the past five years — are part of Virginia Electric and Power Company's program to provide for the rapid postwar growth in electrical load. They bring to 21,000 the total line mileage operated by the 42-year old company.

Fanning out over eastern Virginia and parts of eastern North Carolina and eastern West Virginia, the company serves more than 500,00 customers. Annual production totals more than three billion kilowatthours with power supplied by eight steam-electric generating stations (total capability: more than 600,000 kw) and 16 small hydro-electric stations (total rated capacity: 45,000 kw).

From Station To Station. The 55-mile distance between Virginia Electric and Power Company's Chesterfield Power Station near Chester, Va. and its Bremo Power Station is spanned by this 110 kv wood pole H frame transmission line which was put into service in June, 1947. Conductor is 4/0 copper.





Like so many of America's major power concerns, Virginia Electric and Power Company uses BTC high transmission line hardware — shown here on both lines. Specify BTC Drop Forged Clamps and Fittings for your own transmission lines and enjoy their easier installation and efficient, trouble-free performance.

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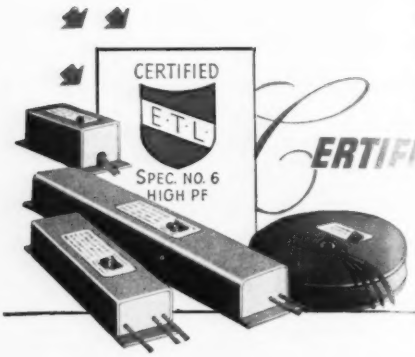
• Complete information on the types of CERTIFIED BALLASTS available from each participating manufacturer may be obtained from Electrical Testing Laboratories, Inc., East End Avenue at 79th Street, New York, New York.

Participation in the CERTIFIED BALLAST program is open to any manufacturer who complies with the requirements of CERTIFIED BALLAST MANUFACTURERS.



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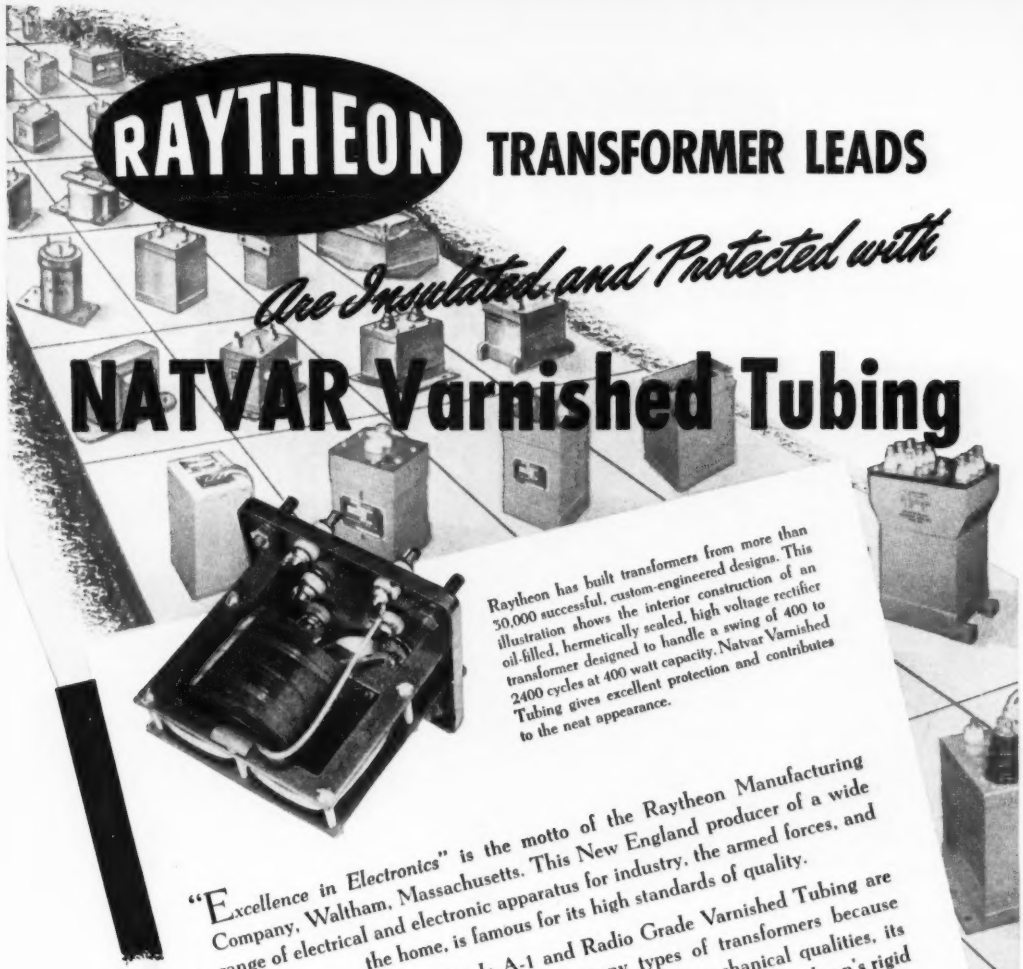

Raytheon has built transformers from more than 30,000 successful, custom-engineered designs. This illustration shows the interior construction of an oil-filled, hermetically sealed, high voltage rectifier transformer designed to handle a swing of 400 to 2400 cycles at 400 watt capacity. Natvar Varnished Tubing gives excellent protection and contributes to the neat appearance.

"Excellence in Electronics" is the motto of the Raytheon Manufacturing Company, Waltham, Massachusetts. This New England producer of a wide range of electrical and electronic apparatus for industry, the armed forces, and the home, is famous for its high standards of quality.

Natvar Grade A-1 and Radio Grade Varnished Tubing are used by Raytheon on many types of transformers because of Natvar's excellent electrical and mechanical qualities, its uniformity at all times, and its ability to meet Raytheon's rigid material specifications.

Natvar Varnished Tubing and other Natvar flexible insulations are available from conveniently located wholesalers' stocks or direct from our own.

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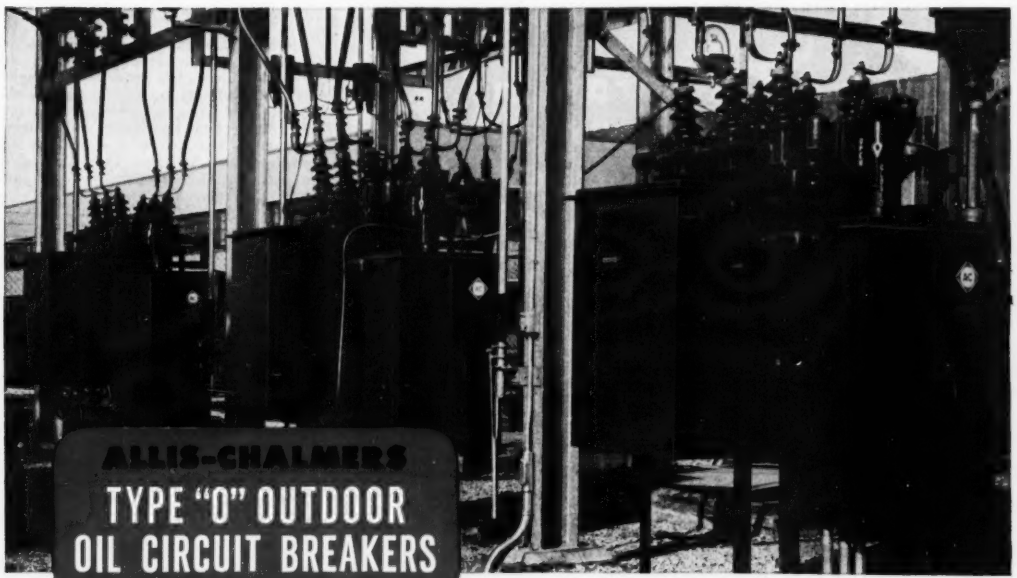

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ALL YOU NEED to order your type "O" breaker is one set of specifications. It's simple and convenient. This standard 3-pole breaker comes to you mounted on a strong lightweight framework with operating mechanism and automatic reclosing equipment each in its own weatherproof housing. The type "O" breaker is factory assembled, wired and tested in accordance with ASA standards . . . ready to install and operate.

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2. **Efficient circuit interruption with high rate of dielectric recovery for low contact and oil deterioration.**
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Feature for feature you cannot buy better breakers in this class. Over 50 years of Allis-Chalmers progress in power circuit breakers is built into them. You can install them with complete confidence. For more information call your local A-C sales office or write Allis-Chalmers, Milwaukee 1, Wisconsin, for bulletins 71B6165A (OX-18) or 71B6093C (OZ-110, OZ-210).

A-3440

Type	Rated KV	Rated Amps. (60 cycle)	Interrupting Capacity KVA
OX-18	7.2	600	50,000
OZ-110	14.4	600	100,000
OZ-210	14.4	600	250,000
OZ-210	14.4	1200	250,000
OZ-210	23	600	250,000

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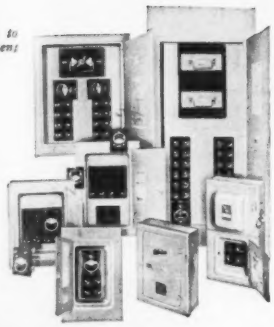
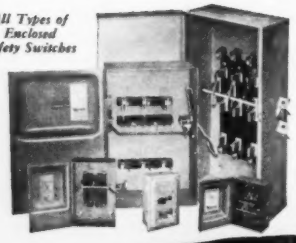
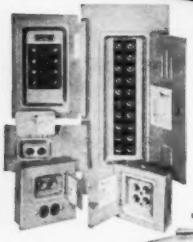


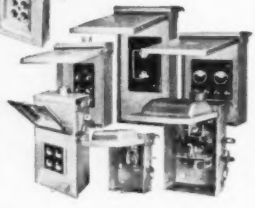
All Types of Enclosed Safety Switches



The General Line is the COMPLETE Line



Extensive Line of Branch Circuit and Residence Panels



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ELECTRICAL BOOKS

Protective Maintenance of Motors and Generators, 64 pages, 5½x8½, Renewal Parts Section, National Electrical Manufacturers Assn., 50c. This booklet is intended for the use of maintenance men in the electrical industry, in handling the problems common to electrical rotating machines, where insulated conductors revolve in or produce magnetic circuits. An appendix has been added, containing NEMA standards for renewal parts, proposed definitions and record forms.

Herbert H. Dow: Pioneer in Creative Chemistry, by Murray Campbell and Harrison Hatton, 168 pages, 7x10, Appleton-Century-Crofts Inc., $3.50. This is the biography of a successful man, an interesting account of the personality and achievements of a scientist. It also reflects the growth of the American chemical industry, made possible through the pioneering efforts of men such as Dow.

Civil Defense in Modern War, by Augustin M. Prentiss, 428 pages, 6x9, McGraw-Hill Book Co. Inc., $6. A text on the protection of the civil population against A-B-C warfare (atomic, bacterial, chemical), General Prentiss presents a program covering major aspects of civil defense. Part I deals with modern air warfare and the weapons employed by the aircraft. Part II presents methods of protecting industries, communities, homes and individuals against various destructive weapons, with emphasis on combinations of protective measures. Part III is a guide to a civil defense program for national, state and local governments. The chapter "Air Power Today" was written by Colonel Augustin M. Prentiss Jr.

Practical Electricity and Magnetism, by Maurice Rubin, 356 pages, 6x9, Chemical Publishing Co. Inc. (price not given). An elementary survey of electricity and magnetism, this book places special emphasis on recent developments in magnetism. The new magnetic alloys, which played a stellar role in the recent war, form a large part of the text. It is applicable for laymen, technicians and students interested in electricity and magnetism. Recent developments, appearing in this volume, have not previously appeared in book form.

Automatic Feedback Control, by William R. Ahrendt and John F. Taplin, 412 pages, 6x9, McGraw-Hill Book Co. Inc., $7.50. This text is concerned with the analysis of automatic feedback control systems and the design or selection of required control apparatus. Material is divided into two parts: (1) discussion of the theory of automatic control, and (2) detailed treatment of the types of problems encountered in each type of industry. Features are: mathematical methods of analysis are presented in simpliest form; the theoretical treatment is simplified by charts and curves; emphasis is placed on the similarity between control reactions in the fields of industry and science; it is the first book to use terminology approved by the ASME and the AIEE; a chapter is devoted to the pneumatically operated control; temperature regulation is covered.

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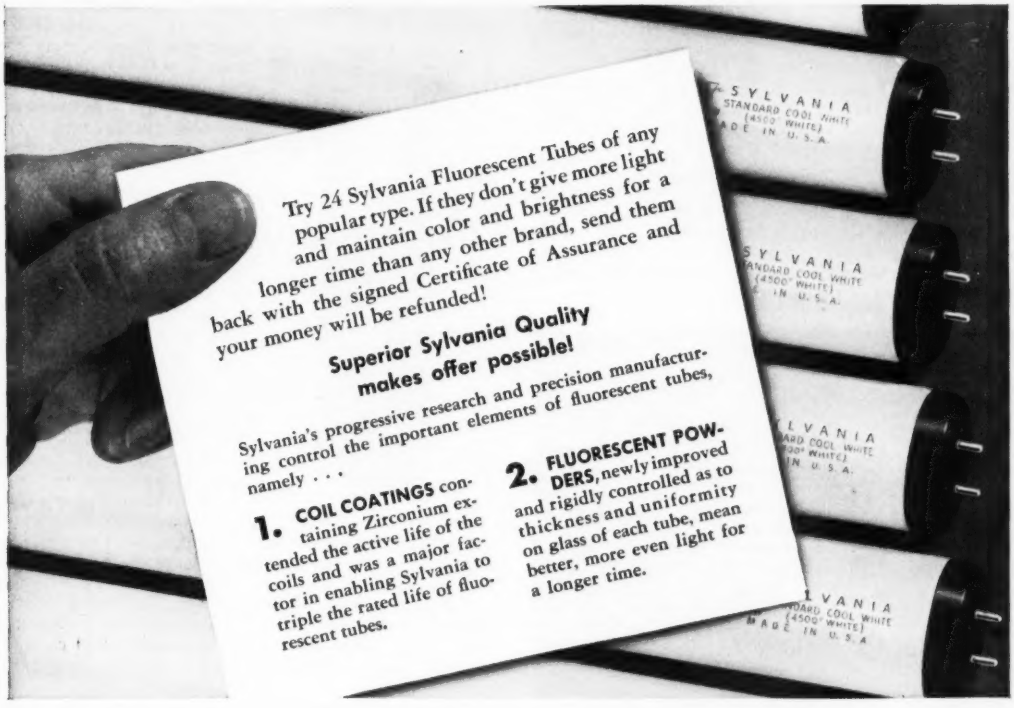
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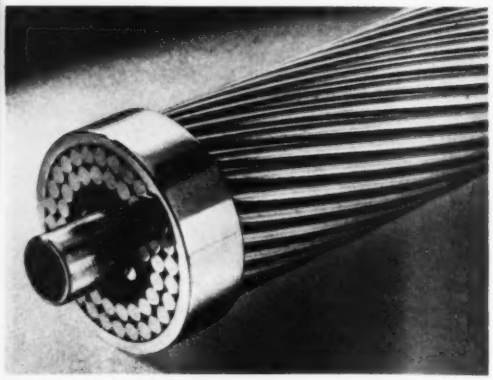
PRODUCT NEWS

Branding Machine

(1) Ralph C. Coxhead Corp., 720 Frelinghuysen Ave., Newark 5, N. J.

A typewriter-like machine with a standard keyboard and changeable type for marking wire has been introduced by the manufacturers of the Vari-Typer. Vinylite tubing (from ⅛ to ½ in. diameter) is clamped into position in the machine and the identifying letters or numbers are "typed" on it. The operation heat-brands the marking below the surface of the tubing to make it indelible and permanent. A special heating device maintains the correct temperature for depositing durable leaf carbon into the brand. Type is instantly changeable and is available in special symbols and foreign languages.



(2) Said to be the largest stranded electrical conductor ever supplied for an overhead transmission line, this 1.6-in.-diameter expanded ACSR cable is being made by Aluminum Co. of America for a 315-330-kv system. Expanded ACSR is designed to give the large diameter required to minimize corona, with economy in use of metal, and at the same time to maintain the customary relationship between strength and loaded weight of conductor. The expanded diameter of this concentric-strand conductor is obtained by introducing nonmetallic strands of suitably treated fibrous material in the intermediate layers between the steel core and the outer layers of aluminum wires. Additional data from Alcoa, 801 Gulf Bldg., Pittsburgh 19, Pa.

Derrick-Digger Attachment

(3) Tel-E-Lect Products Inc., 10025 Minnetonka Blvd., Minneapolis 16, Minn.

Model 325 for ¾- and 1-ton trucks will handle poles up to 35 ft long; has interchangeable augers ranging from 8 to 10 in. It is shipped from the factory ready for installation. The manufacturer claims that normally it takes two men less than ten minutes to set up the derrick, attach the digger, dig the hole and set the pole ready for tamping.

Oil Circuit Recloser

(4) Line Material Co., Milwaukee 1, Wis.

Kyle type E oil circuit recloser is a single-phase unit that gives self-contained protection against temporary or permanent line faults on nominal 23-kv systems. It provides three consecutive automatic reclosing operations, or four openings including the final lockout operation, and employs a single series operating coil that gives energy for the opening, closing and timing functions. Ample protection is provided to circuits up to 100 amp and fault currents up to 1,500 amp.

These interrupting ratings were established after tests on circuits with high X/R ratios, producing high d-c component and high recovery voltage. The manufacturer states that the recloser can interrupt the maximum asymmetrical current on any distribution circuit on which symmetrical fault current is within the recloser rating.

Timing is controlled hydraulically. The hydraulic system counts the consecutive opening operations to trip the lockout mechanism after a fourth opening, and controls the reset when the fault is cleared in less than four opening operations.

The unit will coordinate in series and branch line fuses can be coordinated with it for selective blowing. Radio influence level is well under NEMA standards applicable to 14.4- and 23-kv power oil circuit breakers, it is stated. The unit meets AIEE and NEMA standards or proposed standards applicable to oil circuit reclosers. Safety features are incorporated.

For Additional Information Fill in Coupon on Page 58

NOW . . . stock and use BullDog Vacu-Break Master Switch for all Type A, C, and D applications . . . *at Type C prices!*

NOW! Fill any need for Type A, C, or D switches from one magnificent line of BullDog Vacu-Break Master Switches. End chaos of hundreds of confusing switch catalog numbers . . . work with just 38! Order, stock, install one line. Save time, money, effort.

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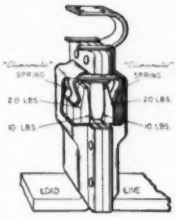
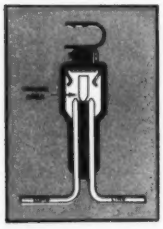
"Clampmatic" is a method for obtaining extra and enduring contact pressure between switch jaws and blades. Clampmatic provides a total of 30 lbs. of contact pressure between both sides of blade and jaw for "bolt-tight" contact.





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- Solderless cable terminals (wire grips)
- Horsepower-rated
- Silver-surfaced current-carrying parts
- Voidable cover interlock
- Spring-reinforced fuse grips
- Ample supply of concentric K.O.'s
- Generous wiring space in all switches

VOIDABLE COVER INTERLOCK! →

Interlock: With interlock pin at Hole A, cover cannot be opened unless switch is OFF. Cover must be fully closed to throw switch ON.

To void interlock: Simply push interlock up and insert interlock pin in Hole B. Switch can then be thrown ON or OFF with cover open or closed.

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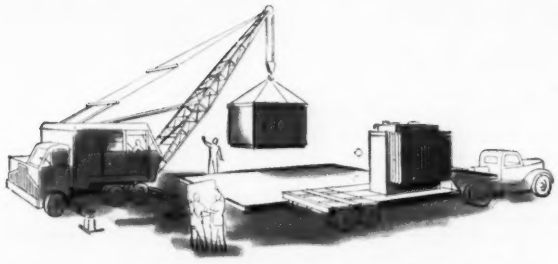

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for lower, long-range distribution costs!

Con Edison's expansion program aims at *long-range* distribution economy. That's why —wherever possible—they utilize modern unit substations. And what they have to say about a recent Westinghouse installation indicates how conveniently they—*and you*—can attain this objective.

"Its compact, factory-assembled design enabled us to immediately realize savings in real estate costs, in preparation of the installation site and in the actual installation itself. Also, it is contributing to better electrical service by improving voltage conditions. Most important, its flexibility and low-cost maintenance features will enable us to *economically maintain* high standards of service in an area where considerable load growth is anticipated."

Con Edison enjoys these benefits because Westinghouse Unit Substations are specifically designed to meet today's power distribution problems. "Unitized" construction enables you to add "blocks of power" to accommodate increased load requirements. And they're available in types to serve the most modern distribution systems.

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UNIT SUBSTATIONS

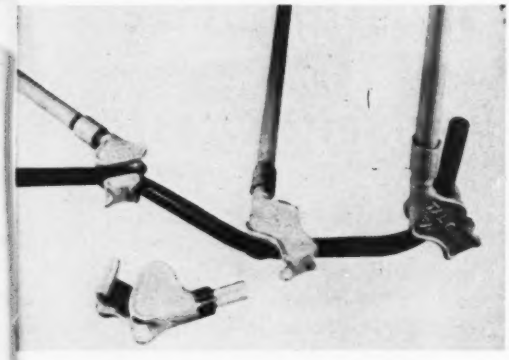
Plants at Berkeley, Calif.; Sunnyvale, Calif.; Emeryville, Calif.; Los Angeles; Portland; Salt Lake City; Seattle; Denver

Current Transformers

(5) General Electric Co., Meter & Instrument Dept., Schenectady 5, N. Y.

A new line of 600-v butyl-molded current transformers, for both indoor and outdoor applications, was designed to reduce customers' stock requirements and inventory costs. The manufacturer states that use of butyl, a synthetic insulator with good chemical stability and resistance to oxidation, does away with need for expensive porcelain and metal cases.

The new unit can be used on single-phase or polyphase circuits. Type JKP-O, first on the market, has primary ratings of 200, 400 and 600 amp; is designed to carry 200% of rated primary current continuously. It is waterproof. Butyl insulation is claimed to assure low moisture absorption, good corona and sunlight resistance, excellent adhesion to copper, very low power factor and protection from mechanical damage.



Bender

(6) Tal Bender Inc., Milwaukee 2, Wis.

A new bending tool that can be used in six different directions features a stub hole for bending or straightening conduit protruding from concrete floors or walls. Safety features are a long neck extending into the pipe handle as proof against accidents caused by pipe handle breaking and no-slip bending jaws.

Arc Drive Control for Rectifier Welders

(7) Westinghouse Electric Corp., Box 2099, Pittsburgh 30, Pa.

A new arc drive control to produce electrical transient characteristics desirable for certain welding operations is available on the manufacturer's type RA selenium welders. Arc drive permits the operator to adjust the arc characteristic of the welder to suit the job. The device operates automatically and instantaneously to give an extra surge of welding current at the moment the arc becomes shorted, either by contact between the electrode and the work or by a globule of molten metal bridging the arc gap. This extra surge helps clear the arc path and prevents arc outage or sticking of the electrode. Violent and prolonged overshoots and undershoots of welding current, characteristic of rotating-type welding generators, are eliminated, it is stated.

Amount of arc drive desired can be set by operator. Adjustment of the control is not critical. A self-heating thermostat in the arc drive circuit is protective feature.

Electrical Tape

(8) B. F. Goodrich Co., Akron, Ohio

An electrical tape made with Koroseal is said to have nontransferring adhesive that can be pressed onto a dry surface innumerable times without losing its stickiness. It has a dielectric strength of 8,000 v; is waterproof, flameproof, resists abrasion, acids, oil alkalies and corrosive salts, the manufacturer states. The tape is ¾ in. wide, .007 in. thick; is packaged in a roll 60 ft long.

Infrared Brooder

(9) LML Engineering & Mfg. Corp., Columbia City, Ind.

The new Cardinal infrared brooder is designed for both large and small operations. The basic rust-resistant metal fixture is 15 in. in diameter and is equipped for four 250-w R-40 lamps. The lamps are set at an angle to give the infrared rays the widest spread. The brooder forms a radiant energy pattern of sufficient area to brood from 300 to 500 chicks, the manufacturer states.

Model CB-30 is for use in an individual brooder house and comes equipped with Waffer thermostat control, four lamps, suspension chain and drop cord. Model CB-20 is for use in conjunction with larger brooding operation where one thermostat controls the entire house; comes with four lamps and suspension chain but without thermostat and drop cord.

Automatic Ring Packing

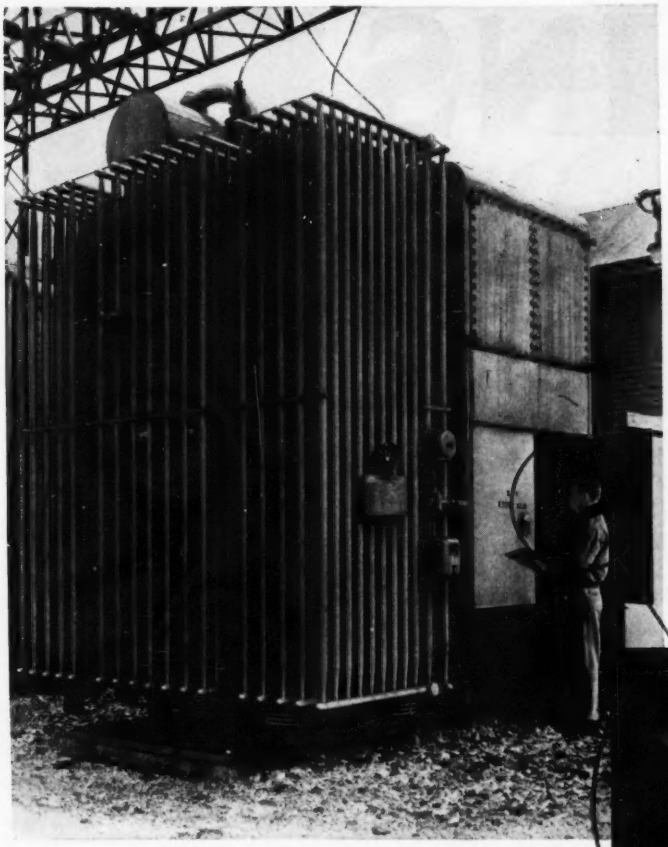
(10) Johns Manville, 22 E. 40th St., New York 16, N. Y.

A new automatic ring packing, Uneepac, is claimed to be particularly valuable in design of new equipment and to open the way for savings. It is a molded packing and each ring is a complete, self-contained packing unit. It is designed for maximum sealing efficiency in minimum packing depth so stuffing box sizes can be reduced. No follower or header rings are needed. Each ring is said to center itself perfectly on the preceding ring and, in service, each lip is always exposed to fluid pressure. The packing comes in various compositions to suit different services, is furnished in sets of endless or split rings and for shafts ⅝ in. diameter and up.

Interval Timer Redesigned

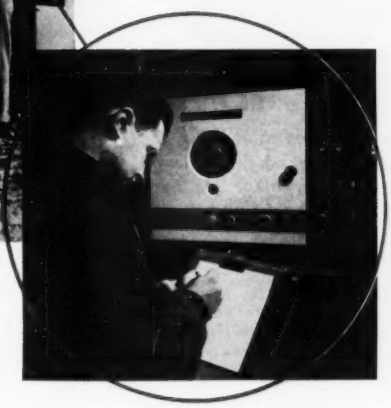
(11) Tork Clock Co. Inc., Mount Vernon, N. Y.

A revised line of single-set timers for commercial and industrial service is available for permanent installation or in portable, plug-in models rated 6 or 15 amp. A self-starting synchronous Telechron motor times and powers a SP, ST normally open a-c switch with heavy-duty contacts of 20 or 30 amp. Time cycles range from 60 minutes to 24 hours.



General Electric transformer rated 6000/7500 kva, 33-kv, installed on Indianapolis Power & Light System. Load-ratio control in low-voltage winding provides ±5% voltage regulation.

Prediction: 14 years of tap changes without any servicing



This particular G-E transformer will operate 14 years at its current rate of 20 tap changes a day before its load-ratio-control equipment requires servicing. This means that for 14 years the maintenance crew will not have to clean insulating surfaces or filter the contactor oil! In fact, the contactor compartment need not be opened during this entire period.

The really significant point, however, is this: We can tell you—and do tell you for each transformer—how many operations the LRC equipment will make before any servicing is required. We have tested the contacts of each design until we know, accurately, the life of the arcing tips. By the use of electrostatic shielding, and by having a major portion of creepage distances in the vertical plane, we prevent dangerous deposits of carbon from forming on insulating surfaces during this period.

In other words, with G-E load-ratio-control equipment, you don't do any *unnecessary* service work. You simply refer to the instruction book and read the counter to predict the time that servicing is actually required.

Over 37,000,000 installed kva have proved that General Electric LRC is as reliable as the core and coils themselves. Call on your G-E representative for a complete discussion on the LRC transformer best suited to your application. *General Electric Co., Schenectady 5, N. Y.*

401-18

GENERAL ELECTRIC

With factories in Anaheim, Los Angeles, Oakland, Ontario, San Francisco, San Jose, Seattle, and Richland, and Sales Offices in twenty Western cities.

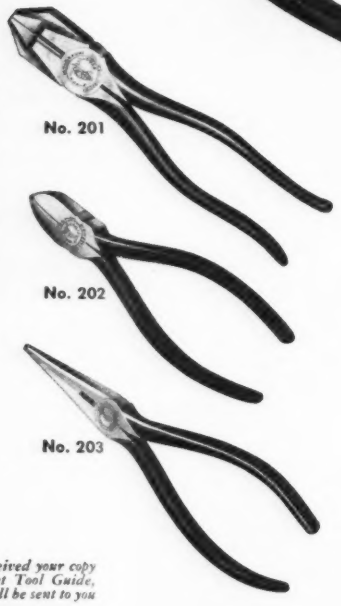
KLEINS

"Since 1857"

When it comes to judging the worth of pliers, ask the man who uses them every day. He'll tell you Kleins—for their hand fit—their proper balance—their carefully matched knives that stay keen longer.

The same top quality that typifies Klein pliers is also characteristic of other Klein tools and equipment—safety straps and belts, climbers, grips and wrenches. Men who know good tools have been choosing Kleins since 1857.

ASK YOUR SUPPLIER
Foreign Distributor:
International Standard Electric Corp.
New York



If you have not received your copy of the Klein Pocket Tool Guide, write for one. It will be sent to you without obligation.

Since 1857
Mathias KLEIN & Sons
Established 1857
Chicago, Ill., U.S.A.
1200 BELMONT AVENUE, CHICAGO 18, ILLINOIS

Outlet

(12) Academy Electrical Products Corp., 3842 9th Ave., New York 34, N. Y.

A 3-way outlet that needs no wire stripping or slitting is available for use as table tap or wall mounting. It is molded of Urea plastic and comes in pearl and brown.

No tools are needed, according to the manufacturer. The latch is opened, wire inserted. When the latch is closed, metal points pierce the insulation and make contact.

The company also makes a plug for use with the outlet.

Cap

(13) Rodale Mfg. Co., Emmaus, Pa.

A molded bakelite armored attachment cap with metal cord clamp features light weight and minimum danger of breakage. It has two parallel blades that fit any standard outlet; is also available with double-action spring blades that give the tension grip required for special purposes. Cataloged No. 1120, the cap is rated 10 amp, 250 v and 15 amp, 125 v. Cord hole diameter is .500 and O.D. is 1½ in. Blades and screws are brass; cord clamp and armor are coated to resist rust and corrosion.

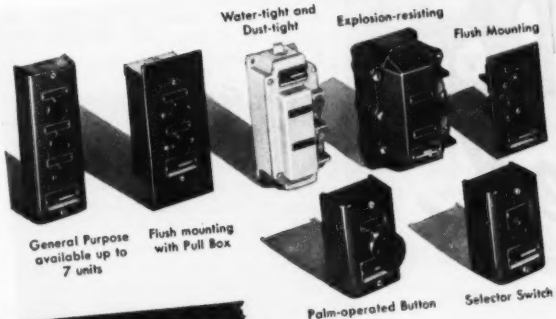
Four-Channel Carrier

(14) Lenkurt Electric Co., County Road, San Carlos, Calif.

A new carrier system can superimpose up to four high-quality voice channels and four dial or ringdown signaling channels on an open-wire line. This type 32E system operates in the carrier frequency range from 3.3 to 35 kc. Equipment coordinates with Type C Western Electric systems.

This COMPLETE Line meets every need for Pushbuttons

STANDARD DUTY



HEAVY DUTY

Name your pushbutton requirement—there's a Square D unit to do the job, exactly. Three complete lines . . . standard duty, heavy duty, and oil-tight heavy duty . . . each providing a wide range of operators, stations, and circuit combinations.

Nine Unit Station (available 3, 6, 9, 12, 16 units)
One Unit Station
Two Unit Station
Three Unit Station
Four Unit Station arranged for horizontal mounting

OIL-TIGHT HEAVY DUTY

Write for Pushbutton Bulletins which give complete details. Address Square D Company,
4335 Valley Blvd.
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SQUARE D COMPANY CANADA LTD., TORONTO • SQUARE D de MEXICO, S.A., MEXICO CITY, D.F.

WIRE AND CABLE
WITH
BRONCO 60
Certified
PORTABLE CORD AND CABLE
YOU GET
• MORE NEOPRENE IN THE PROTECTING JACKET! It is Certified to contain not less than 60% by weight of new Neoprene. This ... INCREASES SAFETY MARGIN, INCREASES RESISTANCE. INCREASES SERVICE LIFE!
• LONGER-LASTING COLD RUBBER INSULATION!
• GREATER FLEXIBILITY!—engineered, rope-like flexibility.
• MORE CONVENIENCE! Jackets are branded with full identifying data. Coils are packaged in neat shelf cartons.
Bears symbol "P116BM," flameproof registration number of the U. S. and Pennsylvania Bureaus of Mines.
Bronco 60 Certified is an Achievement of
WESTERN INSULATED WIRE CO.
LOS ANGELES 58, CALIFORNIA

Mine Power Center

(15) Westinghouse Electric Corp., Box 2099, Pittsburgh 30, Pa.

This new ventilated dry-type mine power center is an integral skid-mounted unit featuring a compact, low-height design, 36 in. high, 45 in. wide, 104 in. long. The unit consists of a high-voltage section, a transformer and a low voltage section.

The high-voltage section consists of a cable disconnecting plug and receptacle (optional) and a primary circuit breaker if desired. The low-voltage section may have as many as four L frame breakers, which are accessible through hinged doors on the side of the unit. Cable receptacles provide for connection to low-voltage feeders. Each breaker is equipped with ground-fault protection. Also available is a lighting tap or auxiliary transformer, together with an F frame breaker to provide a 240- or 120-v single-phase lighting supply.

The transformer is horizontal-type AVR triplex unit, three phase, 60 cycles, 80 C rise with dry-type class B insulation.

Battery Charger

(16) General Electric Co., Schenectady 5, N. Y.

A new motor-generator type battery charger is designed for mounting on balconies or shelves to save floor space. For charging batteries in driver-lead and small driver-ride industrial lift trucks, the new unit accommodates lead-acid batteries of 6-19 cells and nickel-iron-alkaline batteries of 10-30 cells. It is about the size of a tank-type vacuum cleaner with a control box mounted on its side, weighs only 190 lb and can be installed on a shelf measuring 6¾x8¼ in.

The unit is fully automatic and easy to operate, according to the manufacturer. It is only necessary to plug it in and set the timer; automatic controls do the rest. Voltage (based on number of battery cells) and current (based on ampere-hour battery ratings) are adjustable.

The single-circuit equipment operates on 3-phase, 60-cycle, a-c power and has generator-overload and motor-overload protection to guard against excessive currents.

Variable-Speed Drives

(17) Sterling Electric Motors, 5401 Anaheim-Telegraph Road, Los Angeles 22, Calif.

Larger horsepower Speed-Trol electric power drives are designed for variable speed drives of 20- and 25-hp ratings in the chemical, metal working, food and plastic industries.

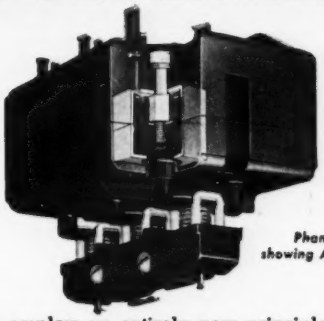
It's All NEW! CLARK TYPE "CY" AC Motor Starter

...with the sensational NEW multi-turn magnetic blowouts...

...and TWIN-BREAK CONTACTS

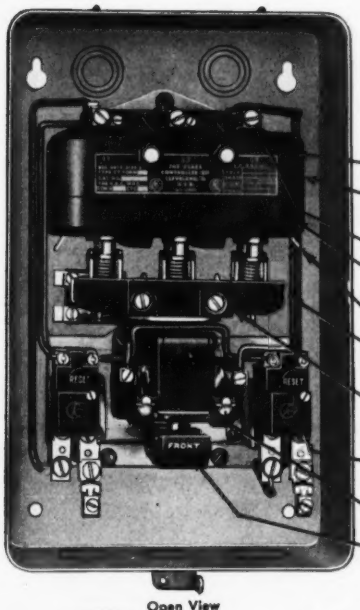
Here, for the first time is a rugged AC magnetic starter that provides the extra protection and dependable operation of "Mill-Type" heavy-duty construction and design.

another CLARK FIRST!



Phantom view showing Arc-shield

Type "CY" starters employ an entirely new principle of arc interruption. The arc is extinguished by the effect of the blow-out coil, *concentric with the contact*. The magnetic field quenches the arc either by lengthening or confining it. In its *forced rotation* it moves continually from a hot to a cold spot—minimizing burning or pitting of contacts. The ingenious design of the arc chamber prevents carbonization and the accumulation of hot gases between wiring terminals—minimizing phase-to-phase failures*.


One piece upper arc shell protects terminals from hot gases
Magnetic arc interrupters with steel arc chambers
Pressure type terminals line and load
Arc shields of inorganic non-carbonizing material
Finger clips for easy contact inspection
Silver double break control circuit contacts
Captive screws in contact arm
Melting alloy type overload relays
Easy coil replacement—only two screws and one pin to remove
Vertical lift magnet with steel guide uses no springs
RESET
RESET
FRONT

Open View

The Maintenance Man's Dream!

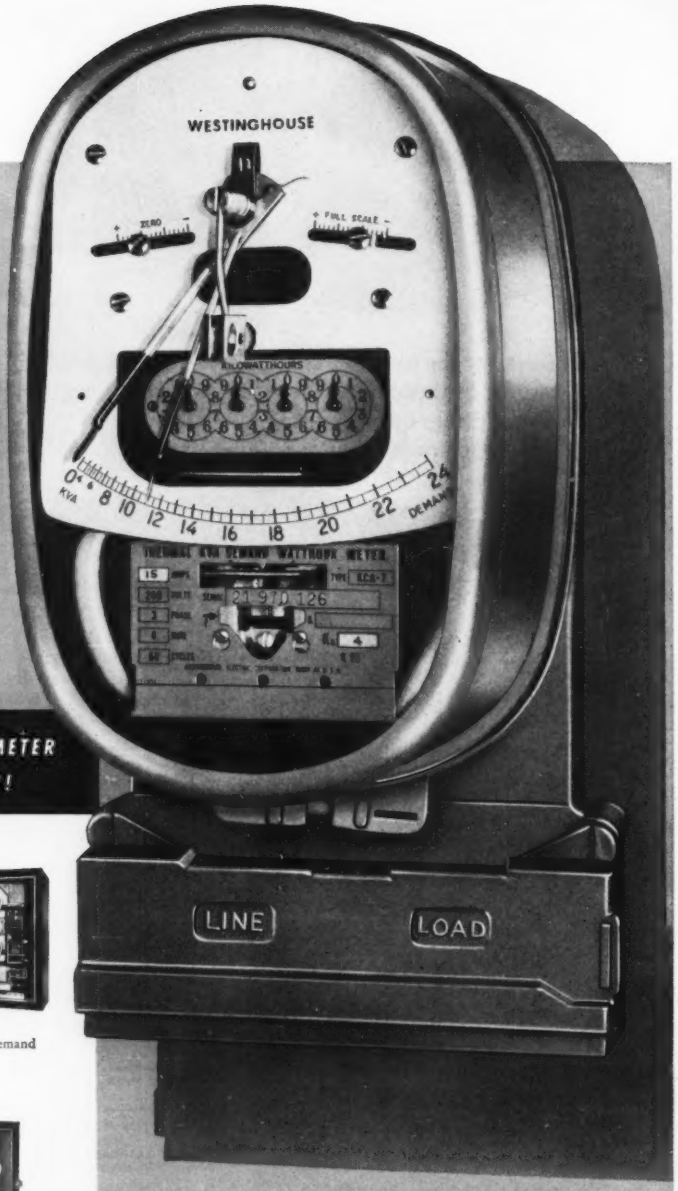
- No filing, dressing or cleaning of contacts!
- No tools necessary to inspect contacts!
- Easy to change moving contacts!
- Stationary contacts changed quickly!
- Remove only two screws and one pin to change coils!
- Remove only four screws to take out stationary magnet frame!
- Power circuit contacts available with springs in complete packaged service kits for ease in stocking!

*Magnetic blow-out coils are used on all size 2 and 3 Type "CY" starters. The same Mill-Type construction is used on sizes 0 and 1.

Let a CLARK application engineer show you what this new line of CLARK "CY" starters means to you in increased production and lower maintenance.

THE CLARK CONTROLLER CO.

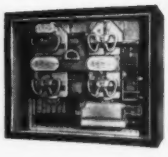
ENGINEERED ELECTRICAL CONTROL • 1142 EAST 152ND STREET, CLEVELAND 10, OHIO



The new KCA combination watthour and thermal kva demand meter is available in five types for a variety of circuit applications. It's the first polyphase combination watthour and thermal kva demand meter on the market.

THERE'S A WESTINGHOUSE METER FOR EVERY APPLICATION!

Polyphase thermal kva demand meters.



Recording kva demand meters.

Totalizing kva recording demand meters.

Kva indicating demand meters.

NEW Combination Polyphase Thermal kva Demand Meter

Cuts KVA Metering Costs!

Here's another Westinghouse "first" that answers a metering problem by helping you to attain low-cost kva demand metering. It's the new KCA Meter which combines a simple, practical method of measuring kva demand, with low maintenance cost. And it joins a large family of cost-savers because only Westinghouse offers you . . .

A complete line of kva demand equipment . . . one that meets all of your present needs and anticipates many of your future requirements!

Illustrated here are some representative examples of the diversified equipment Westinghouse offers for this important application. This is the equipment you need for accurate kva demand measurement of any power loads.

In the complete line of Westinghouse metering equipment you'll spot many opportunities for savings. So whatever your metering needs, call on Westinghouse.

For complete information on the new KCA meter write for Catalog Section 42-340. Address: Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania. J-40395

YOU CAN BE SURE . . . IF IT'S Westinghouse

METERS

Plants at Berkeley, Calif.; Sunnyvale, Calif.; Emeryville, Calif.; Los Angeles; Portland; Salt Lake City; Seattle; Denver.

magno-tronic

DUAL SILVER POINT — FULLY AUTOMATIC

FLUORESCENT STARTERS

—completely eliminate annoying blinking and flickering of dead fluorescent lamps!

GUARANTEED — FOR ONE YEAR!

This is a glow switch condenserless precision starter equipped with automatic thermal relay circuit breaker. The relay automatically removes the lamp from the circuit electrically when the lamp becomes deactivated and automatically resets upon interruption of the lamp circuit.

SIMPLIFIES—Replacement of defective lamp automatically recycles starter circuit. No buttons to push—no replacement of starter.

REDUCES COST—Magno-Tronic starters provide exact timing of electrode heating, preventing excessive loss of emission material, thus assuring maximum possible lamp life.

VERSATILE—Built to operate efficiently over an extended voltage and temperature range.

SP-15-20 For use with 15 or 20 watt lamps.

SP-30-40 For use with 30 or 40 watt lamps.

SP-85-100 For use with 100 watt lamps.

Manufactured under U. S. PATENTS

2298236 2159837 2339307
2334935 2239244 2333694
2341520 1849552

Other Patents Pending

INDUSTRIAL ELECTRONICS CORP.
General Offices & Main Plant, 80 BANK STREET, NEWARK 2, N. J.

WIRE SX PRODUCTS

MAGNET WIRE WITH THE WORKABILITY FOR FAST, LOW COST WINDING

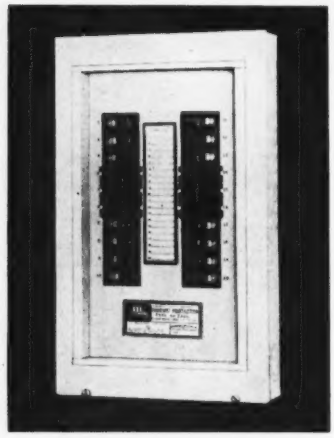
Here's wire of proved workability when subjected to the punishment of modern high speed winding—whether random or layer. It helps insure freedom from broken wires, crossed turns, runbacks, spaced turns and frequent tension adjustments.

Essex Extra Test has the good slip necessary in coil winding. Slides evenly and smoothly in place, resulting in maximum turns in minimum space and in coils that will pack tight. When used for motor armatures, no matter how narrow the slots, Essex extra abrasion resistance reduces rejections.

When you specify Essex Extra Test Magnet Wire for any winding job you can be sure.

ESSEX WIRE CORPORATION
FORT WAYNE 6, INDIANA

WAREHOUSES AND SALES OFFICES: *Atlanta, Ga. *Boston, Mass. * ... Cleveland, Ohio, Dallas, Texas, Dayton, Ohio, Detroit, Mich., Indianapolis, Ind., *Kansas City, Mo., *Los A... Milwaukee, Wis., *Newark, N.J., Pittsburgh, Pa. *Portland, Ore., Upper Darby, Philadelphia, Pa., *Saint Lou... San Diego, Calif., *San Francisco, Calif.



Load Center

(18) Murray Mfg. Corp., 1250 Atlantic Ave., Brooklyn 16, N. Y.

This new load center has a 20-circuit capacity featuring fully magnetic action in each breaker. Operation does not change with varying temperatures. The unit carries 100% of its rated load.

Opposite polarity is provided in each adjacent position by the molded bus construction. This gives the maximum flexibility of circuit connections. It provides any combination from ten 2-pole circuits, 125-250 v a-c to 20 single-pole circuits 125 v a-c.

The bus bar arrangement is of a one-piece construction, with two bus bars (one behind the other) molded into an insulating plastic. This reduces the box width to 12⅞ in. The case is finished with baked-on grey Melamine, for surface or flush mounting.

Transformers

(19) Acme Electric Corp., Cuba, N. Y.

A completely enclosed line of dry-type, air-cooled transformers has a heavy-gage steel case, a steel frame, overhanging cover which makes each unit dripproof. The cover also acts as a vent for air circulation, accomplished through a screened bottom. The manufacturer claims that the class B insulation used in this line of 3-phase, 60-cycle transformers gives ample protection for operation at a temperature rise of 80 C.

Sizes 9, 15 and 30 kva are designed for wall mounting, indoor or outdoor use. Capacities from 45 to 225 kva are for platform mounting, indoor use only. Primary voltages are of 600, 480 and 240 v with secondaries including two 5% or four 2½% taps.

Memo to:
UTILITY SALES STAFFS

Your productive SALES IDEA...

-Electric Range Activity

-Electric Kitchen Promotion

-Commercial Electric Cooking Activity

-Electric Water Heater Activity

-Electric Dishwasher Activity

. . . can be a prize winner in the

1951 HUGHES AWARDS!

Your Company may be using or planning an effective sales idea which has proved successful in solving a major appliance merchandising problem in your area. Why not give it an opportunity to gain recognition for you or your company in the 1951 Hughes Award Competitions? Duplicate prizes are to be awarded to both large and small companies. Hughes Awards brochure gives complete details.

The Hughes Awards for 1951 will be based on productive sales ideas regardless of the size of the company or conditions in the territory served. The winners will be the individuals and/or companies submitting the most constructive selling methods relating to the activities shown above. Elaborately prepared entries will have no advantage over simple, documented case-histories of successful sales programs.

Arrange now to enter the promotion plan or sales campaign that helped your Company bring some worthwhile electrical servant into the homes of your area.

The 1951 Hughes Award Brochures have been mailed to Electric Operating Utility Companies.
If you need additional information write to
Edison Electric Institute, 420 Lexington Avenue, New York 17, N. Y.

UTILITY DIVISION

Hotpoint Inc.

(A General Electric Affiliate)
5600 West Taylor Street, Chicago 44, Illinois

WE'LL SOLVE YOUR GENERATOR AND MOTOR BRUSH PROBLEMS FOR YOU

A motor is just as efficient as its brushes. Often an excellent motor is put into operation equipped with brushes selected for general use. Atmospheric conditions, temperature and overloading make for inefficiency in performance. Our engineers will gladly make the proper recommendations to increase motor efficiency with the use of *proper* brushes.

Send for our reference book in your Category:—Industrial, General Purpose, Mining, Welding, Appliances.

ORDER YOUR CARBON BRUSHES FROM A SINGLE SOURCE

West Coast Representative
C. F. BOWERS
544 S. San Pedro St.
Los Angeles 13, Cal.

THE OHIO CARBON COMPANY
12508 GEREA ROAD • CLEVELAND 11, OHIO

Steam Turbine Line

(20) General Electric Co., Schenectady 5, N. Y.

A newly designed line of multistage, mechanical-drive turbines comes in ratings from 200 to 5,000 hp.

Type DP multistage turbine, rated 200 to 3,000 hp, is for driving pumps, compressors, fans, blowers, etc. The 200- to 5,000-hp DR turbine is for applications requiring wider speed range, greater accuracy of control and greater capacity. Type DRV, rated 200 to 5,000 hp, has the governing characteristics of the DR multistage turbine but utilizes automatic sectional valves linked to the oil relay governor instead of the single governor controlled valve. Casing construction on all three is similar. From two to ten stages may be used.

Type DRVX is designed for applications where process steam is desired at a definite, steady pressure. Speed governoring characteristics are similar to the DRV but a pressure governor is added.

High Temperature Sleeving

(21) The H. I. Thompson Co., 1733 Cordova St., Los Angeles, Calif.

A fibrous silica insulation originally developed in batt form for jet aircraft has been adapted for all types of industry.

Called Refrasil, the material is a removable blanket claimed to provide maximum insulation up to 1,800 F with less than one-half the weight and bulk of comparable materials.

One of the new uses of Refrasil is that of sleeving as electric space separators in thermocouple leads. This sleeving may be applied with maximum effectiveness where temperatures up to 1,800 F are encountered, the manufacturer states. Sleeving is available in many sizes and lengths. Braided Refrasil sleeving is said to be especially useful where flexibility is needed.

Solenoid Contactors

(22) Ward Leonard Electric Co., Mount Vernon, N. Y.

The new Bulletin 4458 size O.A.C. solenoid contactors are multipole units designed for both load and control circuit use in controllers for machine tools, refrigeration, air conditioning equipment and similar applications. Contactors come in 3- and 5-pole forms. Contacts can be interchanged to form N.O. or N.C. poles. Up to three N.C. poles can be secured.

"FROM MOLTEN METAL To Finished Product"

Every Step Under Wagner Control

You get the finest "to work with" when you use Wagner Electrical Fittings. Tough, accurately cast, precision threaded, you're sure of uniform quality when they're Wagner's.

Every step from pattern to flask, to the pouring of molten iron, through machining, plating, sorting and inspecting are Wagner controlled.

Years of specialization, and experience in the manufacture of Malleable Electrical Fittings are a guarantee of dependability. Specify Wagner Fittings and be sure of easier, smoother installations. Nationally distributed through leading wholesalers.

WAGNER MALLEABLE PRODUCTS CO., 222 W. Adams Street, Chicago 6, Illinois. Foundry and plant, Decatur 60, Illinois.

Write today for illustrated Catalog 483. You'll find it a handy reference.

WAGNER
Malleable Fittings

Western Representatives: Murphy-Hain Company, 720 E. Second St., Los Angeles 12, Calif. Fred E. Stabbe & Sons, 2046 Arapahoe St., Denver 2, Colo. Hodges & Glamb, 1264 Folsom St., San Francisco 3, Calif. Northwestern Agencies, 4130 First Ave., S., Seattle 4, Wash.

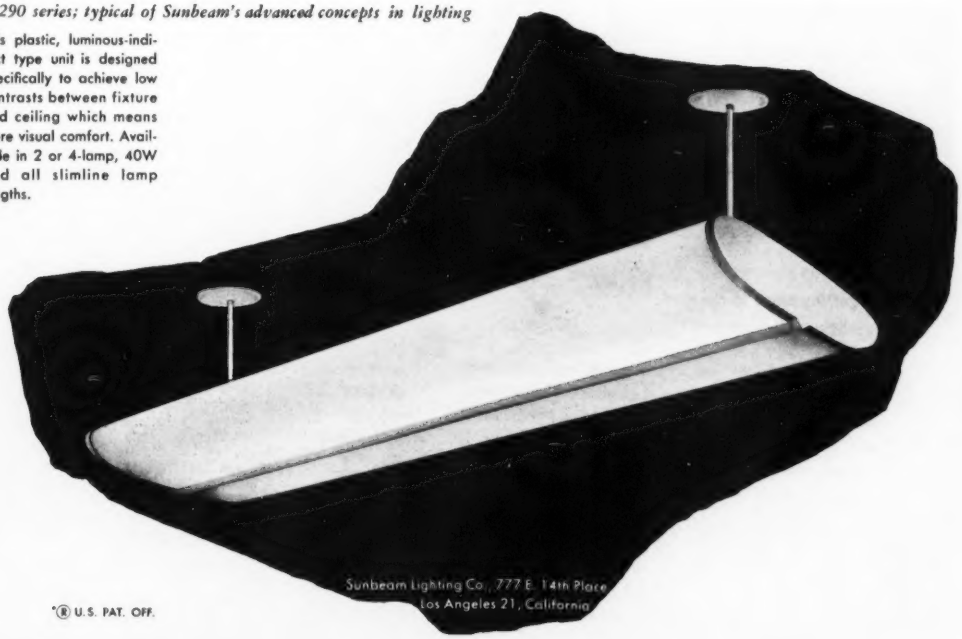
SUNBEAM visionaire

SUNBEAM means PROGRESS in lighting

Every day marks another step forward in the science of lighting at Sunbeam. In contrast to the old days, the modern approach to luminaire designing is based on the concept of function. Backed by photometric research, Sunbeam visionaires* are designed to produce definite or specified illumination characteristics. On this premise, the style or appearance is also engineered. Because of this design program, you will find a fixture for every commercial purpose in the Sunbeam line. From showcase lighting to the most critical demands of industrial or commercial installations consult a Sunbeam engineer first.

The L1290 series; typical of Sunbeam's advanced concepts in lighting

This plastic, luminous-indirect type unit is designed specifically to achieve low contrasts between fixture and ceiling which means more visual comfort. Available in 2 or 4-lamp, 40W and all slimline lamp lengths.



Sunbeam Lighting Co., 777 E. 14th Place
Los Angeles 21, California

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Cole ELECTRIC CO.

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- *Avoid crop damage*
- *No getting stuck in the mud*
- *Improve public relations*

DO a faster, *better* job with a scientifically-designed PENGO Auger—the twin-helix auger that bores clean, true holes in any kind of soil, most sandstones, hardpan, decomposed rock, frozen ground—and even in permafrost. Saves power, cuts maintenance to a minimum! 15 sizes; to fit any earth boring machine.

★ **ORDER NOW** *or write today for data and prices*

PETERSEN ENGINEERING CO.
MANUFACTURERS
SANTA CLARA, CALIFORNIA

(23) SWITCHES — Rigid lever-actuated high-capacity basic switches in a new V series has been added to the manufacturer's line. They are listed by Underwriters' for ¾ hp, 115 v a-c, 1½ hp, 230 v a-c, 20 amp, 125, 250 or 460 v a-c, 10 amp, 125 v a-c L (suitable for controlling tungsten filament lamp loads on a-c circuits. Made by Micro Switch, Freeport, Ill.

(24) RELAY—A low-loss midget relay made by the R-B-M division of Essex Wire Corp., Logansport, Ind., has a maximum capacitance between contacts and to ground of 2½ micro microfarads. It can be furnished with single-pole, normally open or normally closed; two pole, normally open or normally closed and single-pole double-throw contact form. Maximum rating is 3 amp noninductive at 28 v d-c.

(25) TACHOMETER — The Dr. Horn centrifugal hand tachometer is available again through James G. Biddle Co., 1316 Arch St., Philadelphia 7, Pa. The new instrument is basically the same as was offered previously. It has six ranges covering from 25 to 30,000 rpm in one instrument. Details in bulletin 35-65-11.

(26) TRANSFORMERS—A new line of dry type transformers with class H insulation for station auxiliary, unit substation and network service has been introduced by Pennsylvania Transformer Co., P. O. Box 330, Canonsburg, Pa. They are available as ventilated or sealed-in-nitrogen units. The former are made in ratings up to 3,000 kva and in voltages up to 15 kv; the latter in sizes up to 2,000 kva, 15 kv and below.

(27) HOT PLATE—A heavy-duty laboratory hot plate with graduated heat control has been added to the Chromalox line. Its new Chromatrol control switch permits variability of the first 50% of total wattage of the unit, making it possible to maintain continuously the desired temperature of liquids or other materials. Models are rated between 660 and 2,000 w and provide surface temperature up to approximately 800 F. The plates operate on 120 or 240 v a-c. Made by Edwin L. Wiegand Co., 7540 Thomas Blvd., Pittsburgh 8, Pa.

(28) REGULATORS — Lighter weight, higher efficiency, smaller size and extra ruggedness are features claimed for the new subway-type CMH constant-current regulator available from Westinghouse Electric Corp., Box 2099, Pittsburgh 30, Pa. They come in ratings of 3-30 kw., 2.4/4.8 kv, 6.6 or 20 amp.

(29) COUNTER—Potter Instrument Co., 115 Cutter Mill Road, Great Neck, N. Y., has a miniaturized version of its 4-tube electronic counter decade. The unit, approximately one-third smaller than the standard decade, is available in two models differing only in maximum counting capabilities. Model 12 is for counting at rates up to 130,000 counts per second and Model 13 for rates up to 30,000 counts per second.

(30) DIMMERS—Superior Electric Co., Bristol, Conn., has redesigned its line of packaged Powerstat dimmers. Assemblies of 2,000-w series are now available in packages of 3-, 4-, 5-, and 6-unit dimmers.

(31) FAN—A 20-in. ventilating fan that can be used as an exhaust, intake or floor fan has been announced by Lonergan Mfg. Co., Albion, Mich.

"GENEVA ACTION"

Indicating Demand Register

low reset load on motor

long motor life

positive reset by Geneva action — no shock

minimum number of parts

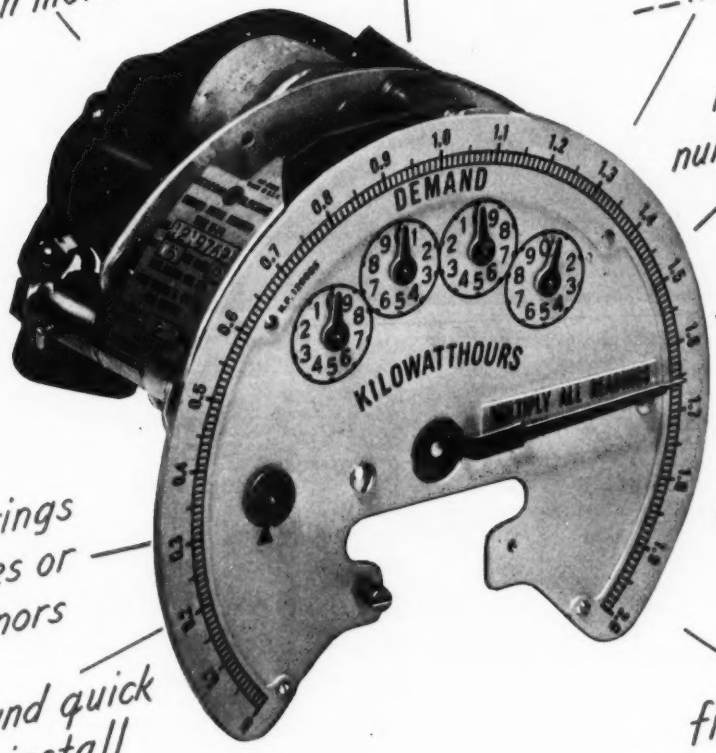
long scale 9½ inches

simple adjustments

maximum flexibility in demand measurements

easy and quick to install

no springs latches or governors



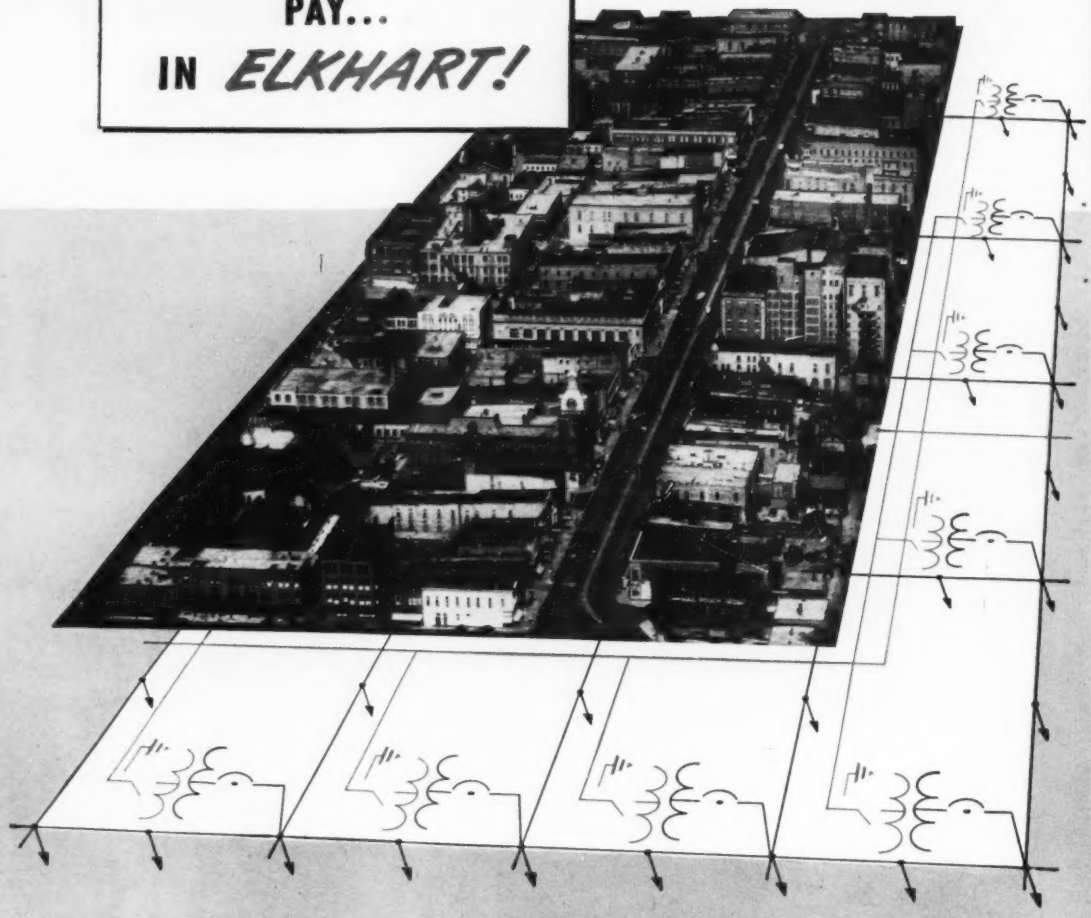
TYPE M-30 INDICATING DEMAND REGISTERS may be installed on standard General Electric watthour meters. Type M-31 cumulative demand register is also available. For more information, contact your nearest G-E representative or write for M-30 bulletin GEC-413 or for M-31 bulletin GEC-272. General Electric Company, Schenectady, N. Y.

601-31

GENERAL ELECTRIC

With factories in Anaheim, Los Angeles, Oakland, Ontario, San Francisco, San Jose, Seattle, and Richland, and Sales Offices in twenty Western cities.

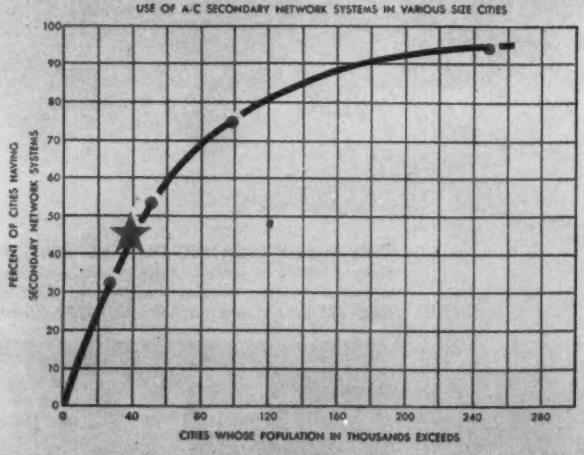
NETWORK SYSTEMS PAY... IN *ELKHART!*



FACTS ABOUT ELKHART'S A-C SECONDARY NETWORK SYSTEM.

The secondary network system is supplied from 13 vaults having a total capacity of 3,900 kva. The area covered by Elkhart's network is almost 20 square blocks, containing 3.61 miles of conduit, 5.47 miles of primaries and 2.27 miles of secondary feeders.

One third of all cities in the United States with a population of 25,000 or more have network systems, while one half of all cities with a population of 50,000 or more have network systems.



17 years' uninterrupted service... no voltage-regulation problems

There's no power service problem in the business district of this bustling Indiana town of 40,000 . . . they took care of that 17 years ago. Then, Elkhart was struggling with an overloaded radial system, consisting of 3-phase primaries and both 3-phase and single-phase secondaries . . . tranformers were mounted on practically every pole. The Fire Department and fire underwriters were concerned . . . the utility was plagued with voltage-regulation problems.

OVER AND UNDER . . . In 1934 the Indiana and Michigan Electric Company met the problems of Elkhart's business district by installing an *A-C Secondary Network System.* Transformers and primaries were placed underground . . . the secondaries and services overhead. This overhead and underground combination, particularly applicable to smaller cities and towns, made possible great economy in the original installation cost.

IMPROVED SERVICE . . . The A-C Secondary Network System has resulted in a high standard of continuity of service and uniformly good voltage-regulation, not attainable through radial distribution systems. Underground placement of the primaries and transformers has greatly reduced congestion and improved appearance.

ABOUT MAINTENANCE . . . Maintenance story here is typical of all users of secondary networks . . . it's low, almost negligible. The utility reports that in 17 years of operation, there has never been a complete interruption of the system. Underground crews like the convenience of maintaining the system. They know . . . they work with the equipment.

CUSTOMERS AND UTILITIES BENEFIT . . . Utility customers appreciate the high-quality service and uniformly good voltage-regulation afforded by network service. The utility benefits from reduced operating and maintenance expense and improved customer good will. Large or small, your town can have high-quality network service . . . at a cost commensurate with the benefits this service affords. Westinghouse makes this equipment and can help in your planning. Call or write: Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa.

J-97155

YOU CAN BE SURE... IF IT'S Westinghouse

NETWORK EQUIPMENT

Plants at Berkeley, Calif.; Sunnyvale, Calif.; Emeryville, Calif.; Los Angeles; Portland; Salt Lake City; Seattle; Denver.

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PIN TYPE SOCKETS
SOLD *than all other makes combined!*

Ever Ready Pin Type Sockets offer the most convenient and economical means of obtaining outdoor or indoor temporary lighting, since the tedious stripping, soldering and taping operations are eliminated.

In street decoration, construction lighting, carnivals, roadside stands, etc., their ease of installation and convenient flexibility is unsurpassed.

Insist on UNION'S PIN TYPE SOCKETS — the FIRST and the BEST.

UNION
INSULATING CO.
PARKERSBURG, W.VA.

BULLETINS ETC.

(32) **INSULATIONS**—Eight bulletins on Vartex electrical insulations, including varnished materials and resinous products, have been released by Insulation Manufacturers Corp., 565 W. Washington Blvd., Chicago 6, Ill. They are: No. 750A, varnished cotton base cloth and tape insulation; No. 750C, straight cut varnished silk; No. 750D, varnished asbestos cloth; No. 750B, vanished glass cloth and tape insulation; No. 750, silicone resin coated glass cloth and tape insulation; No. 750E, varnished paper; No. 750F, resinous sheeting and tape; No. 310, extruded tubings.

(33) **HEATERS**—A second edition of its 12-page booklet on electrical space heaters has been prepared by Markel Electric Products Inc. and La Salle Products Inc., Buffalo 3, N. Y. Wall-insert, wall-surface attachable and portable models, with automatic thermostat or manual control, are listed.

(34) **BATTERY CHARGER**—Electric Products Co., 1725 Clarkstone Road, Cleveland 12, Ohio, is offering bulletin 11-220 describing its 4-circuit motor generator battery charger.

(35) **FUSE CUTOUTS**—Catalog sheets on its 5-kv heavy-duty fuse cutouts are available from Line Material Co., Milwaukee 1, Wis.

(36) **TERMINALS**—A new line of self-insulated Sta-Kon terminals is described in data sheet S4 from The Thomas & Betts Co. Inc., 70 Butler St., Elizabeth, N. J. These units are claimed to be particularly suited for use in cramped quarters.

(37) **CONTROL UNIT**—Type 400 control unit for banked secondary transformer systems is covered in bulletin 2015, available from Heinemann Electric Co., O.S.E. Dept., Trenton, N. J.

(38) **BREAKERS**—The new line of heavy-duty, type RHE oil circuit breakers is described by Pacific Electric Mfg. Corp., 5815 Third St., San Francisco, Calif., in the August issue of its publication, "Outdoor Switchgear."

(39) **SWITCHES**—Type YSW outdoor group-operated side-break air switches are described in catalog 130 from Pacific Electric Mfg. Corp., 5815 3rd St., San Francisco 24, Calif. These rotating-insulator type switches have silver-to-silver high-pressure rolling contacts, come in 7.5, 15, 23 and 34.5 kv, 400, 600 and 1,200 amp and 46, 69 and 115 kv, 600 and 1,200 amp. The same manufacturer recently issued catalog 159 on type GW-1 grounding switches and catalog 164 on manual operating mechanisms for tilting-insulator air switches.

(40) **MOTORS**—Data on ratings construction and types of large vertical induction motors are contained in bulletin 05B7629 from Allis-Chalmers Mfg. Co., 939 S. 70th St., Milwaukee, Wis. These motors come in ratings upward from 60 hp at 200 rpm. Except for bearing arrangement, mechanical construction is basically the same as that of horizontal units.

(41) **TUBINGS**—Bulletin 250A from insulation Manufacturers Corp., 565 W. Washington Blvd., Chicago 6, Ill., gives technical data on Dieflex tubings and sleevings for insulating leads and wires in all types of electrical equipment. Types having cotton, rayon or glass base braids with oleoresinous varnish, vinyl resin or silicone varnish treatments are covered.

(42) **AIR CONDITIONING**—A 12-page booklet, B-5158, describing the benefits of air conditioning in different types of business and industrial installations is offered by Westinghouse Sturtevant Division, 200 Readville St., Hyde Park, Boston 36, Mass.

ELECTRICAL WEST
68 Post St., San Francisco 4, Calif.

Not good after December 1

Please send me, without obligation, the new product information or catalogs described on the following pages and identified by numbers circled below:

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NAME . . . . . TITLE . . . . .

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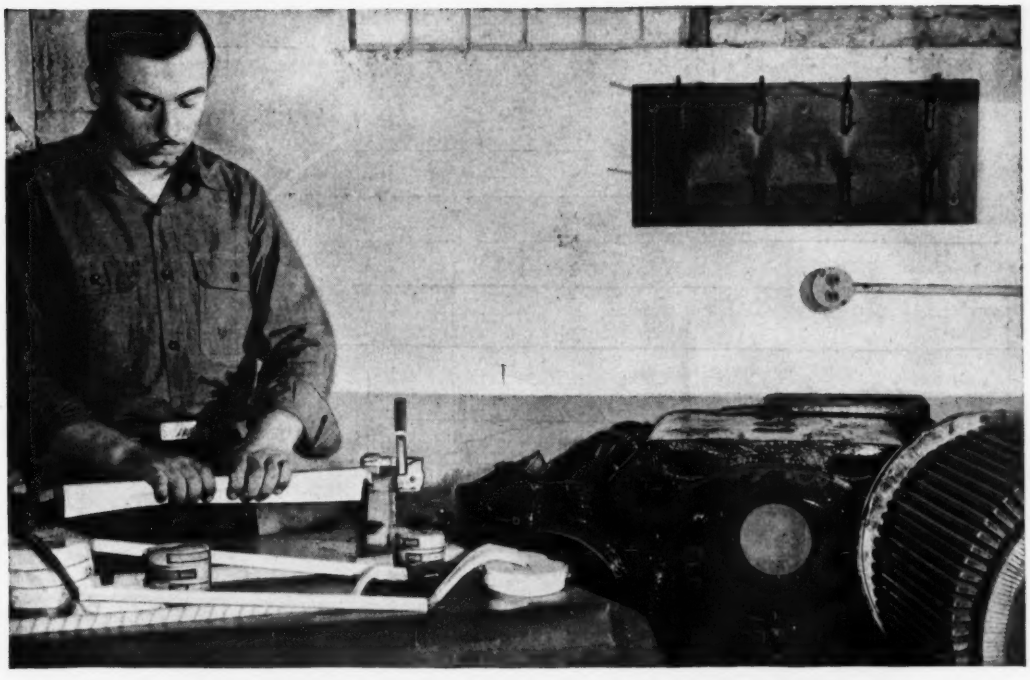
* Please include your company's name and your position, since we cannot ask manufacturers to send literature unless you do.



Everson Electric Co. counts on SILASTIC TAPE "...When insulation must stand up at 500° F"

For outstanding insulation characteristics and for lasting performance at high temperatures, the choice is Silastic* Tape at Everson Electric Company, Allentown, Pa., manufacturers of armature, field and stator coils for railway and heavy-duty industrial applications.

"The ability of Irvington's Silastic Tape to stand operating temperatures up to 500° F increases the life of our coils," says Everson, "and it saves space *too*."

Here are some *other* reasons why so many leading manufacturers turn to Silastic Tape:

The combination of Fiberglas** cloth and Silastic rubber impregnation and coating gives high tensile strength and excellent chemical resistance, even at high temperatures.

After vulcanizing, Silastic Tape forms a solid insulation mass, free from voids or air pockets . . . moisture-proof, extremely abrasion-resistant.

Worth looking into, isn't it? Ask for the full story today!

*® Dow Corning **® Owens Corning Fiberglas Corp.

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Please send me technical literature on Silastic Tape.

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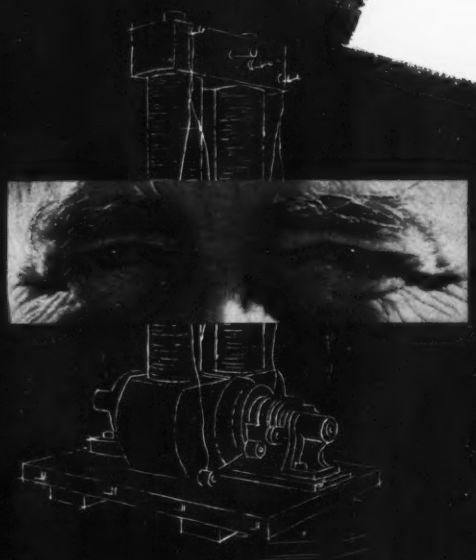
Represented in the Western States by C. D. La Moree, Los Angeles, Berkeley, Seattle, Portland; Electric Motor Supply Co., Denver

the future lives in men with ideas



Even the miracle man of Menlo Park was surprised at the results of his early experimentation with dynamo design. Edison's ungainly "longwaisted Mary Anns", built in 1883 to improve upon existing dynamos having efficiencies of 38% or less, were almost 2½ times as efficient! One of thousands of notable contributions to power generation, this event helped to realize the great IDEA of an electrified America.

KERITE—already well known as an insulating material when the electric power industry began to take form—assumed an early, important, and continuing role in the insulation of aerial, underground, and submarine cable. Its properties, still unrivaled today, are proving themselves in more and more vital circuit applications.

By conscientious workmanship, careful handling, and a continuing search for new applications of its unique formula, The Kerite Company has been able to anticipate the power industry's needs. It will continue to apply itself to the technical world of "ideas" in which now, as in Edison's day, the future of America's power still lives.

The Kerite Company, 30 Church St., New York 7, N. Y.
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KERITE CABLE

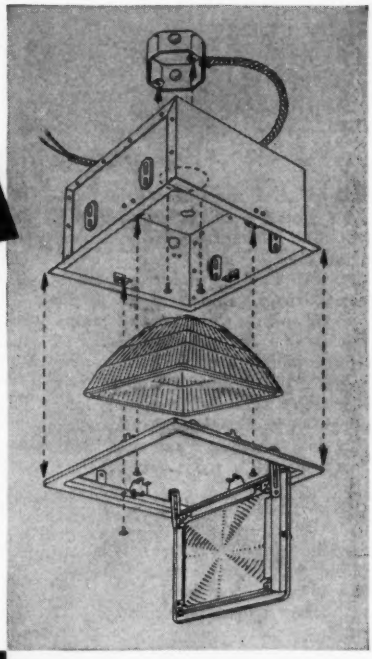
Kerite Insulation—Your Cable's Best Life Insurance

The LIGHT-TIGHT DUO-FRAME

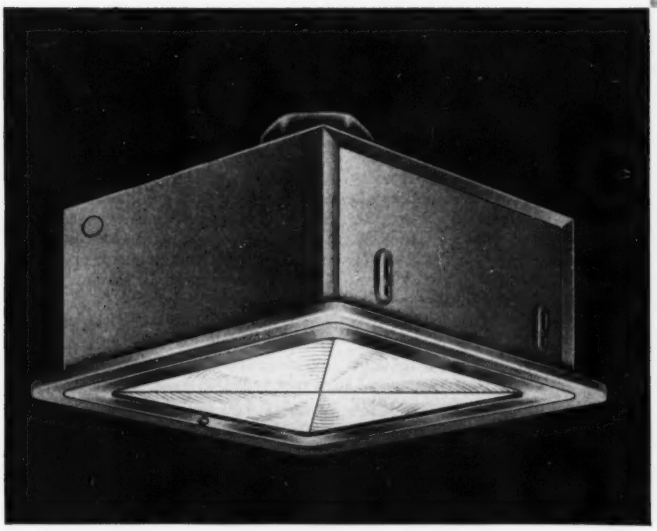
DAY-BRITE'S newest recessed lighting units

PREVENT DAMAGED CEILINGS...

MAKE LIGHT LEAKS IMPOSSIBLE...



Just mount these handsome, new Day-Brite fixtures and stop worrying about ceiling damage, paint scrapes, or unsightly finger marks . . . caused during installation, cleaning or relamping. Day-Brite's Duo-Frame brings you these advantages because the Duo-Frame is simply . . . two frames! The outer frame is fastened to the box after painting and plastering have been completed, and it remains in position during servicing. The inner frame, mounted to drop hinges, is easily removed for servicing. And this exclusive Day-Brite light-tight engineering eliminates all light leakage.



30 GREAT FEATURES INCLUDE:

Holophane Controlens* for maximum efficiency, even illumination and low brightness.

Die-formed, riveted and welded construction throughout.

Two sizes: Available for 8½" and 12" square Holophane Controlens,* vertical or horizontal lamp mounting.

Frame finished in Hot-Bonded Lustre Aluminum Enamel, rust-inhibited before painting.

For complete information on the new Duo-Frame write Day-Brite Lighting, Inc., 5412 Bulwer Ave., St. Louis, Mo.

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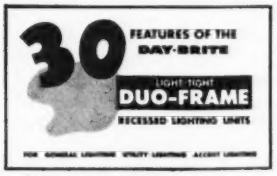
AMERICA MUST SEE WHAT IT'S DOING

IT'S EASY TO SEE WHEN IT'S "DECIDEDLY BETTER" DAY-BRITE *Lighting Fixtures*



162

For a quick look at all 30 big features ask for this free booklet.

ELECTRA'S HUSBAND

The Snake That Swallows Itself

"WELL I see where Eric Johnston told Bill Green's AF of L boys that inflation will wipe out us middle class."

It was Paul, an old contractor-dealer friend, who said it as he wrapped me up a package of lamps. Paul is one of those old-fashioned business men who is wise enough to recognize his size and make the best of it. He's been in the game long enough to know most of the angles. I couldn't visualize Paul ever being wiped out. He's too useful to society.

"Not that it will do any good," I retorted. "Bill Green is too busy dishing out the old platitudes in order to remain in office to realize that he's wiping out his best friends, the middle class."

"Never used to think much of this class business in this country," mused Paul. "But lately it's come on us almost as bad as in the old countries. What's come over labor anyway—unless its bigness? That could do it. When it was poor like you and me it didn't act so blind."

"That'll do it," I answered. "Bigness goes to the head, you might say."

"Well, fat between the ears is pretty near as deadly as around the beltline and sometimes I think labor is getting both. Have you read any of these 'demands' they put into their bargaining contracts lately?"

"Yes, dillies, aren't they?"

"Wonder who's going to support them in the luxury they'd like to become accustomed to if they *get* all they ask for? Longer vacations, travel to and from the job at double time, hospitalization—paid by the boss naturally, free lunches, hot coffee at 10 and 4 served no doubt by a platoon of chorus girls, Monday's off—at full pay, garages to park their Cadillacs in. Who said *'working'* class?"

"Well Paul," I said, only half jesting, "if we middle class people are to survive we've got to get the government to make *us* a law for owners of businesses so that we can have some of this collective bargaining too."

"I'm all for that. Now us contractors—we surely need pensions as much as our electricians do. The wear and tear on us is twice as hard as on our mechanics these days. All they have to worry them is where we're going to get the dough to pay them every week. At the prices some of us are bidding our jobs we surely can't lay aside any retirement fund."

"How about shorter hours for the boss?" I asked. "And double pay for that midnight toil over a set of plans or to balance the books?"

"Don't get me started," this from Paul, with a new gleam in his eye. "Oh boy, could I use some paid holidays, and somebody else to collect for me like the union makes me for it."

"When you come down to it, Paul, you contractors and dealers are the sales force for the labor of your mechanics. Wouldn't it be nice now to have a guarantee from somebody to sell for you?"

"Wait a minute. Don't go too far. Who would that sombody be but the government? And that bunch of bureaucrats can't sell worth a darn. We'd all starve if they took hold that far. Their idea of selling is doling it out—and the best plums go to their friends."

I had to admit that danger. Paul maintained though that Bill Green was talking through an old hat with his present line of palaver. The so-called working class hardly works any more, and certainly it is better off than most of the small business men it works for. Maybe not when it works for a huge concern, but certainly for the small business.

"I see too that they had to give up trying to define what a *small* business is," said Paul. "One thing seems clear to me. When they talk about small business getting some defense contracts they aren't looking at such as me. They think of all business as being manufacturing. But about two-thirds of all American business is in distribution and service.

"In this electrical game, for instance, there are maybe a dozen big manufacturers, 50 to 100 smaller ones. But that only represents a small part of all of us engaged in electrical business. The rest of us are dishing it out. I don't see where we fit in on any of this defense stuff."

"You don't. You're only supposed to pay for it, didn't you know?"

"What with?" asked Paul.

"Ah Paul, I see you need a course in the new economics. They'd have the answers for you, even if you couldn't understand them."

"They might have answers," said Paul with contractor realism, "but you and I can't eat answers. And I doubt if Bill Green's boys of the IBEW would take them for pay."

"Good thing electricians can't eat wire and pipe or they'd put in some demands like the packinghouse workers union did to one big meat packer, I read about in *Business Week*," I recalled. "They demanded a 15-lb ham for Christmas and Easter, and wholesale prices on all the choice meats."

"That's what they've been doing to me, buying their appliances from me wholesale. One so-and-so even bought wire and fittings to go out and wire a house and beat me out of a job."

"But that wasn't all the meat packer workers demanded." I pulled out a clipping from BW I'd kept because people wouldn't believe me. "The union put in 27 demands. Listen. It wants a $3,000-a-year assured annual wage, a cost of living bonus adjusted monthly, an employer-financed social service fund, and besides free meat, free lunches every day or $1-a-day payment in lieu of free lunch, besides regular pay for the lunch period, two hours travel time daily at regular pay—"

"Pikers! The electricians want double time for travel," said Paul.

"—and a birthday holiday, with eight hours straight wages."

"All this added on to the cost of meat? Whew!" Paul whistled, as one who knows what the arithmetic of prices is. "If this keeps up labor won't be able to afford food either. Then maybe it could try living by eating its own demands, eh? They are fat and juicy enough."

EXCITING CURRENT
Reduced 50%
WITH THE NEW Curvacore TRANSFORMER

1. EFFICIENT CORE AND COIL ASSEMBLY

The *Curvacore* distribution transformer has high electrical efficiency and low operating cost. It's designed with a wound core made up of cold rolled oriented steel with high flux carrying capacity and low hysteresis loss. Improved coil design offers a more balanced arrangement of core steel to copper. Increased cooling area within windings keeps copper-to-oil gradient low.

Now, you get these added benefits:

1. Exciting current reduced 50%
2. Better ratio of losses
3. Regulation improved 15%
4. Thermal capacity improved
5. Size and weight reduced 15%.

The *Curvacore* distribution transformer is a good investment because its performance will save you money on your system. You get top performance for every dollar you spend.

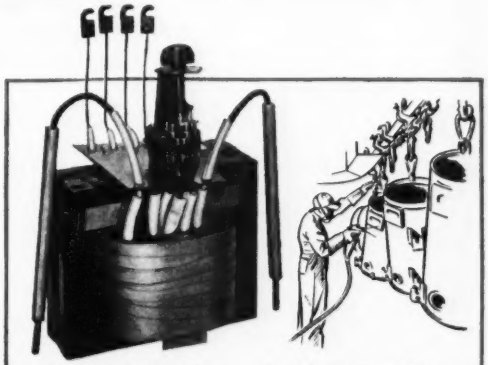
2. EXACTING FINISH EXTENDS TANK LIFE

Formed from heavy gage steel, the *Curvacore* transformer tank is exceptionally strong and completely tight. Tank joints are machine welded to insure permanent protection against leaks and then pressure tested. Tanks are *Spra-Bonderized* and then painted with three coats of alkyd-resinous paint . . . each separately baked on. Previous to shipping, the completely assembled transformer is tested for oil tightness on a machine that tips it toward an inverted position.

Curvacore transformers are now being built in ratings 25 kva and lower. Soon higher ratings will be available.

For more information on *Curvacore* distribution transformers, see your local A-C representative. Or write Allis-Chalmers, Milwaukee 1, Wis. A-3413

Curvacore is an Allis-Chalmers trademark.



New internally operated tap changer has handle and position indicating dial plate above the level of the oil.

Special treatment makes surfaces resistant to industrial and humid atmospheres and salt spray.

Gasket seals are thoroughly tested on the tilt table.

Curvacore TRANSFORMERS

ALLIS-CHALMERS A-C

In spite of continuing material shortages
Steel City is maintaining production of . . .

***All* Outlet Boxes and Covers**
***All* Switch Boxes**
***All* Conduit Fittings**

In fact . . .

***All* Products that are a part of its complete line**

As always
Steel City Leads in Meeting Contractors' Needs

THESE WEST COAST REPRESENTATIVES ARE AT YOUR SERVICE

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REPRESENTATIVE OF STEEL CITY'S COMPLETE LINE
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ELECTRICAL WEST
SPOKESMAN FOR THE MOST HIGHLY ELECTRIFIED SECTION OF THE U. S.

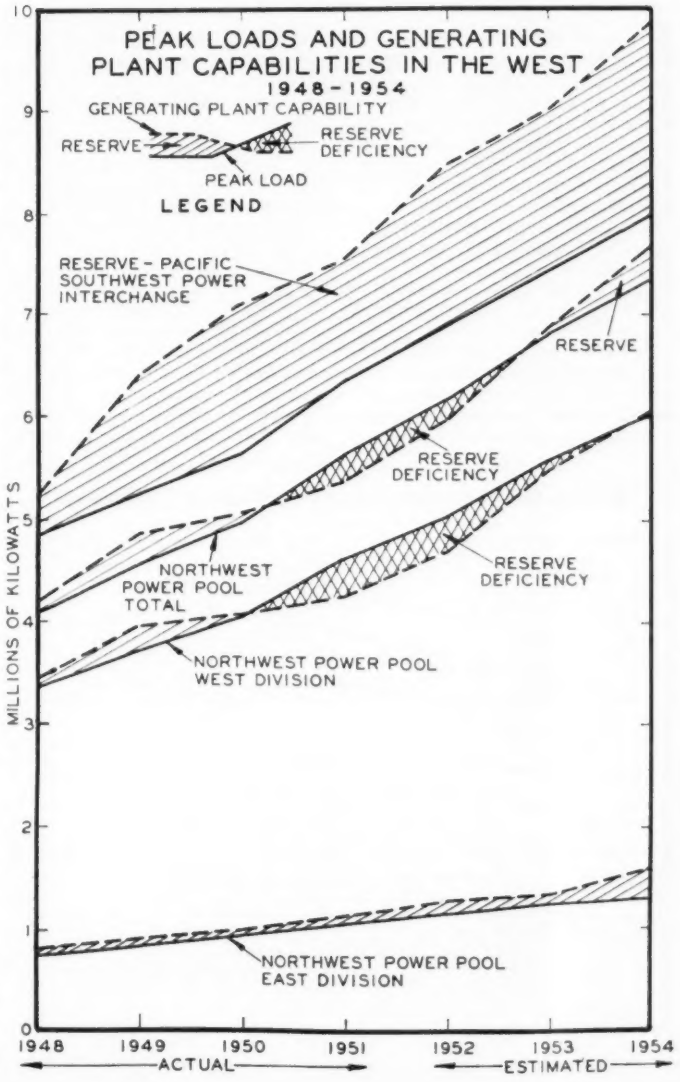
The Western Power Outlook

With the exception of the area served by the western group of the Northwest Power Pool in Oregon, Washington and northern Idaho, there appears to be ample power in the Far West to meet all present foreseeable power loads during the 1951-1954 period. In the Northwest the situation is definitely bad. A long-feared poor water year has finally caught up with that region. At this writing (Sept. 20), the first curtailment order by DEPA had become effective. At midnight on Sept. 17, loads being served by the Bonneville Power Administration under interruptible contract clauses were ordered off. An exception was made by DPA to permit full-scale production of magnesium at Spokane and chlorates at Portland. This resulted in a cut of 245,000 kw of interruptible instead of the full 314,000 kw under contract. Within a week from issuance of this order a brownout order affecting display lighting was expected. The next step would be a cutback on power use in general industry. An orderly plan for curtailment has been set up by DEPA designed to work the least hardship in the area.

Long-Time Picture

A year from now the situation is expected to be less critical because of the likelihood of one dry year not following another and because of 377,000 kw in new nonfederal machine capacity being completed in time to help meet the 1952-53 winter peak. The long-time over-all picture of Northwest reserves is given by the accompanying graph.*

Elsewhere in the 11 Western states there appears to be a sufficient margin of reserves to carry through the



* From paper "The Western Power Situation" by W. C. Heston, ELECTRICAL WEST, and Edwin Fleischmann, consulting engineer, presented before the American Chemical Society, Sept. 4, in New York, courtesy of that society. It is based on EEI figures for April 1951.

mobilization period. That statement is predicated, of course, on reasonable maintenance of delivery schedules for new generators on order, and upon the assumption that no unforeseen large blocks of power will have to go into electrochemical or electrometallurgical plants.

The present situation and the power outlook in the four major power areas of the West are separately reviewed in the pages that follow. The accompanying graph gives a quick over-all picture for three of the regions.

Northwest Heads Into Power Shortage

C. A. Erdahl

Chairman, Pacific Northwest Utilities Conference Committee
Tacoma

The large industrial area served by the western group of the Northwest Power Pool faces a certain serious power shortage this fall and winter. At this writing (Sept. 14) the extent of the shortage, the nature of the impact of curtailment or restrictions, who will suffer most and how much economic damage will result are definitely imponderables.

The public and industrial management are awakening to the serious possibilities latent in the current situation. Rain, lots of rain, enabled the region to meet its load requirements last year when an equally serious situation could have resulted from critical water conditions. This is another year, with new complications, new additional loads and less than sufficient machine capacity to meet requirements. Further, it has been a long, dry summer throughout the region with far below normal rainfall.

It has been something of a struggle to fill power reservoirs and drafts have already started; western Washington and Oregon streams draining from the Cascades have fallen to critical lows and the mighty Columbia has finished its big summer runoff and its flow has been shrinking down close to critical volume.

These are just some of the physical characteristics of the situation. In addition there are construction characteristics under way that, while they may help to relieve the deficiency next year or the following year, are tending to reduce storage this fall. These have to do with nonfederal new dam construction and with federal drafts on Grand Coulee storage for the Columbia Basin reclamation project involving drafts of both power and water that otherwise would be usable for power.

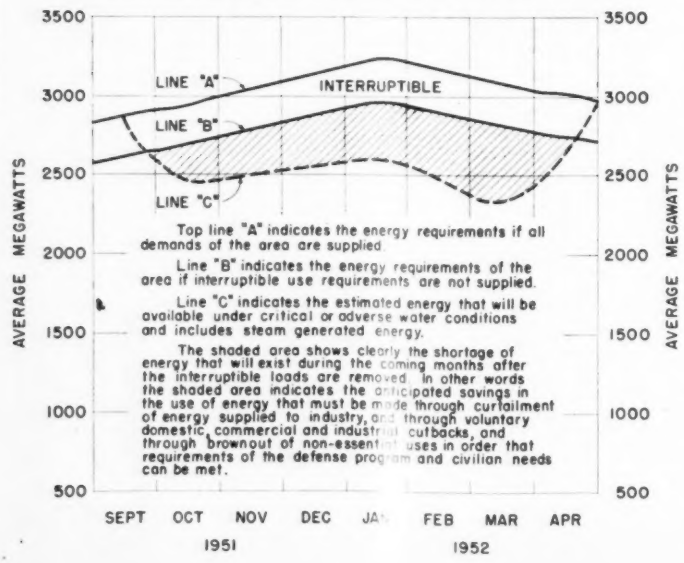
Still other characteristics are those of defense needs and politics. Although ample evidence has been shown that City of Tacoma's Cowlitz River projects would solve within three years a large part of the hydro deficiency, federal authorization is still withheld at this writing, continuing delays that have dogged the project for more than two years. The principal resistance to granting of FPC license has come from Interior, which also currently has the responsibility for defense electric power resources. This adverse influence was so strong that even the presiding examiner for FPC recommended against issuance of the licenses. Among his conclusions was the assertion that there was no showing of need of this project for defense power requirements of the area. The FPC will hold oral arguments on the application on Oct. 31, and there is still hope that this important project will be given the green light.

It seems as if the Northwest Utilities Conference Committee or its chairman and utility and power pool coordinating engineers have spent half the summer in Washington, D. C., in conference with DEPA and DPA and Mobilization Chief Charles Wilson and committees of the Congress. We have battled for full appropriations for the federal program in the Columbia system to keep authorized projects as nearly as possible on schedule.

Yet there is a question today and at this moment unsettled as to who will be curtailed in event of critical water in this predominately hydro-powered region.

My meetings with DEPA in Washington at the end of August led to a

Western Group, Northwest Power Pool Energy Requirements


3500
3000
2500
2000
1500
1000
500
AVERAGE MEGAWATTS
LINE "A"
INTERRUPTIBLE
LINE "B"
LINE "C"
Top line "A" indicates the energy requirements if all demands of the area are supplied.
Line "B" indicates the energy requirements of the area if interruptible use requirements are not supplied.
Line "C" indicates the estimated energy that will be available under critical or adverse water conditions and includes steam generated energy.
The shaded area shows clearly the shortage of energy that will exist during the coming months after the interruptible loads are removed. In other words the shaded area indicates the anticipated savings in the use of energy that must be made through curtailment of energy supplied to industry, and through voluntary domestic, commercial and industrial cutbacks, and through brownout of non-essential uses in order that requirements of the defense program and civilian needs can be met.
SEPT
OCT
NOV
DEC
JAN
FEB
MAR
APR
1951
1952

Yale Dam site on the Lewis River, where Pacific Power & Light Co. is rushing a 100,000-kw plant to be ready for the 1952 peak

Calendar of Planned New Generation for Northwest Power Pool Area

Date	Sizes (kw)	Plant	Agency
1951			
Oct.	11,000 (H)	Fish Creek	Calif. Ore. Power
Fall	27,500 (H)	C. J. Strike	Idaho Power
Dec.	27,000 (H)	Cushman No. 2	Tacoma City Light
Dec.	5,000 (H)	Station M	Portland Gen. Elec.
Total	70,500		
1952			
Jan.	55,000 (H)	C. J. Strike	Idaho P&L
Oct.	75,000 (S)	Gadsby	Utah P&L
Oct.	15,000 (H)	Clearwater No. 1	Calif. Ore. Power
Oct.	71,250 (H)	Hungry Horse	USBR
Nov.	150,000 (H)	Cabinet Gorge	Wash. Water Power
Dec.	20,000 (H)	Clearwater	Calif. Ore. Power
Dec.	71,250 (H)	Hungry Horse	USBR
Winter	100,000 (H)	Yale	Pacific P&L
Winter	14,000 (H)	Willamette Falls	Portland Gen. Elec.
Total	581,500		
1953			
Spring	6,000 (S)	Telluride	Telluride Power
June	50,000 (H)	Detroit	Army Eng.
Aug.	270,000 (H)	Ross	Seattle City Light
Nov.	71,250 (H)	Hungry Horse	USBR
Nov.	50,000 (H)	Canyon Ferry	USBR
Dec.	50,000 (H)	Detroit	Army Eng.
Dec.	18,000 (H)	Big Cliff	Army Eng.
Dec.	140,000 (H)	McNary	Army Eng.
Dec.	30,000 (H)	Lemolo No. 1	Calif. Ore. Power
Dec.	30,000 (H)	Lemolo No. 2	Calif. Ore. Power
Winter	150,000 (H)	Rock Island	Chelan PUD
Total	865,250		
(H) Hydro			
(S) Steam			

Date	Sizes (kw)	Plant	Agency
1954			
April	70,000 (H)	McNary	Army Eng.
Aug.	70,000 (H)	McNary	Army Eng.
Aug.	14,200 (H)	Albeni Falls	Army Eng.
Dec.	84,000 (H)	Lookout Point	Army Eng.
Dec.	70,000 (H)	McNary	Army Eng.
Total	308,200		
1955			
Feb.	14,200 (H)	Albeni Falls	Army Eng.
April	70,000 (H)	McNary	Army Eng.
June	15,000 (H)	Dexter	Army Eng.
Aug.	14,200 (H)	Albeni Falls	Army Eng.
Aug.	70,000 (H)	McNary	Army Eng.
Dec.	70,000 (H)	McNary	Army Eng.
Dec.	65,000 (H)	Ice Harbor	Army Eng.
Dec.	65,000 (H)	Ice Harbor	Army Eng.
Total	383,400		
1956			
April	65,000 (H)	Ice Harbor	Army Eng.
April	70,000 (H)	McNary	Army Eng.
Aug.	70,000 (H)	McNary	Army Eng.
Aug.	65,000 (H)	Ice Harbor	Army Eng.
Sept.	25,000 (H)	Cougar	Army Eng.
Sept.	15,000 (H)	White River	Army Eng.
Sept.	81,000 (H)	Green Peter	Army Eng.
Dec.	70,000 (H)	McNary	Army Eng.
Dec.	64,000 (H)	Chief Joseph	Army Eng.
Dec.	64,000 (H)	Chief Joseph	Army Eng.
Dec.	64,000 (H)	Chief Joseph	Army Eng.
Dec.	64,000 (H)	Chief Joseph	Army Eng.
Dec.	20,000 (H)	Chief Joseph	Army Eng.
Total	737,000		

full conference of substantially all public and private power utilities with Deputy DEPA Administrator Ken Whitaker and staff in Tacoma on Sept. 6.

DEPA was told in Washington and again in Tacoma that curtailment of industrial power supplies and even conservation of power by the general public would be hard to establish unless the large block of interruptible loads, chiefly aluminum, carried by the Bonneville Power Administration, were dropped at the earliest moment after it seemed that critical conditions were probable. More than a year ago, the government was urged to allocate no more defense aluminum or other high-load-factor processing to the Northwest until substantial new generation was available to carry it.

Some of the production people in Washington indicated that aluminum would not be sacrificed, notwithstanding that it has been Bonneville's policy in the past to drop its interruptible load in face of any critical hydro condition. In August, Bonneville began preparation of its industrial customers for probable cutback of interruptible deliveries. BPA sent out notices to all concerned and at the end of the month brought them into a conference in Portland where they were again told that they must plan on a cutback of 314,000 kw—barely half the estimated deficiency this fall and winter.

By the time this reaches the reader, DEPA will most certainly have issued its directive, setting up preliminary control of the whole area involved in the deficiency. Johann H. Gumz, lately with Pacific Gas and Electric Co. at San Francisco, has been named chief of the utilization conservation branch of DEPA and he will activate the conservation program from headquarters, probably in Tacoma. (Editor's note: On Sept. 17 DEPA issued an order cutting of interruptible as the first step in curtailment.)

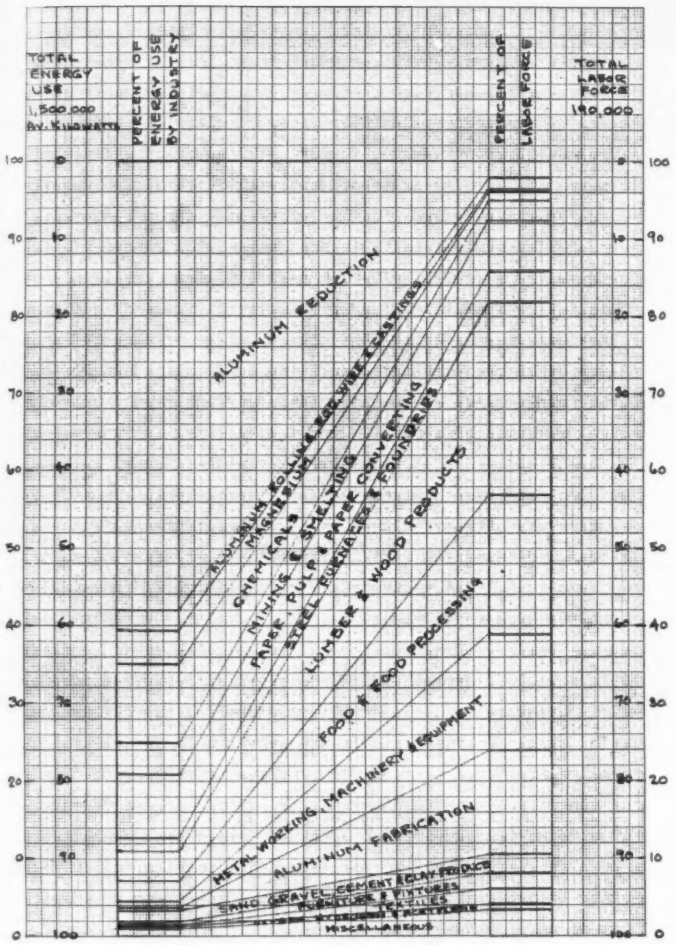
Our conference committee has prepared all basic information on loads for guidance of DEPA and will cooperate to the fullest extent possible in making any directive work to insure maximum benefits and minimum damage to the regional economy. At this point only long, heavy and almost continuous rains can minimize a disastrous result of "too little too late" in the federal program of pacing electric power use in the Northwest.

The nonfederal utilities are working like mad to race through their new projects — Washington Water Power's 150,000 kw at Cabinet Gorge, Idaho; Pacific Power & Light's 100,000-kw Yale project on the Lewis in southwestern Washington; Chelan PUD-Puget Sound Power & Light's addition to Rock Island Dam in central Washington; Seattle City Light's 90,000-kw addition to Skagit and Tacoma City Light's new 27,000-kw unit at Cushman No. 2, both in western Washington. All of these are fairly close to schedule, but only a minor part of the new capacity will be on this line this coming midwinter. On Sept. 14, Grand Coulee's eighteenth generator was put on the line and there's no more to be gained this in the foreseeable future.

On the Columbia, Reclamation Bureau's Hungry Horse Dam in northwestern Montana, valuable for downstream benefits, is being pushed as are Army's Corps of Engineer projects at McNary, Chief Joseph and Albeni Falls, but none of these offers any help this approaching season and all are two years away at least for substantial help.

Meanwhile there is no letup in what the utilities consider "normal" load growth, running 10 to 15% gains compounded annually with a minimum of load-building activity.

The serious aspect, of course, is that of the amount of unemployment that can result from curtailment of industrial loads. We hope it may be negligible, but we have our fingers crossed and are praying for rain, great quantities of it!



Western Group, Northwest Power Pool

Graph showing relation of electric energy use to labor force employed by industries

Southwest Power Reserves Are Adequate

If the generating capacity now on order is delivered and placed in operation on the scheduled dates, if there is sufficient fuel, if the material for planned interconnections is delivered and placed in service on the scheduled dates, and if the demands are not materially greater than revised load estimates as of Sept. 19, 1951, the Southwest Power Interchange Committee believes that, by pooling all the resources in the area and by efficient use of interconnections, there will be sufficient resources to supply the estimated power demands in the Pacific Southwest area for the four-year period 1951-1954.

These are the general conclusions reached in testimony presented at hearings before the California Public Utilities Commission at Los Angeles on July 6, 1951, and San Francisco Sept. 19, 1951. At the latter hearing it was brought out by utility representatives that the power outlook had deteriorated in some respects since the Los Angeles meeting in July. Delivery schedules for steel, new generators, boilers and large power transformers have worsened considerably in the interim, load increases were underestimated, and trouble in some large generating units has made it necessary to reduce loading on these units. Most serious of these disturbing elements is the sagging of delivery schedules. It was strongly emphasized by all utility representatives that if the area is to meet its future loads it is imperative that construction and equipment delivery schedules be maintained. Even then, margin of reserve over peak load will be so slim during several critical periods between the present time and the end of 1954 that an error of only a per cent or so in load estimates, further delay in delivery schedules, or the unscheduled outage of large generating units could turn slim margins of reserve into deficiencies.

Some of the charts and tables on load and resource studies made by the Pacific Southwest Power Interchange Committee for submission to DEPA earlier this year, and for presentation at the commission hearings mentioned, will be used to substantiate the above conclusions.

Table I—Installed and Scheduled Additions to Generating Capacity, Pacific Southwest Power Area, California Only

1950 - 1954

Capacity in Megawatts

	Pacific Southwest Power Area			State of California		
	Hydro	Fuel	Total	Hydro	Fuel	Total
Installed operating capacity (Dec. 31, 1949)	3,668	2,809	6,477	3,512	2,613	6,125
1950 additions	249	320	569	249	260	509
Total end of 1950	3,917	3,129	7,046	3,761	2,873	6,634
1951 scheduled additions	561	442	1,003	188	442	630
Total end of 1951	4,478	3,571	8,049	3,949	3,315	7,264
1952 scheduled additions	100	586	686	10	556	566
Total end of 1952	4,578	4,157	8,735	3,959	3,871	7,830
1953 scheduled additions	30	580	610	30	540	570
Total end of 1953	4,608	4,737	9,345	3,989	4,411	8,400
1954 scheduled additions	0	1,003	1,003	0	856	856
Total end of 1954	4,608	5,740	10,348	3,989	5,267	9,256
Total additions 1950-1954	**940**	**2,931**	**3,871**	**477**	**2,654**	**3,131**

	Total Area			Per Cent		
	Hydro	Fuel	Total	Hydro	Fuel	Total
Added capacity 1947-1950 incl.	642	1,444	2,086	30.8	69.2	100.0
Scheduled capacity 1951-54 incl.	691	2,611	3,302	20.9	79.1	100.0
Added scheduled 1947-54 incl.	1,333	4,055	5,388	24.7	75.3	100.0
Capacity Dec. 31, 1946	3,275	1,685	4,960	66.0	34.0	100.0
Capacity Dec. 31, 1954	4,608	5,740	10,348	44.5	55.5	100.0

Background on Interchange Committee

Electric systems in the Pacific Southwest power area include practically all the interconnected systems in Arizona, California and Nevada. The Pacific Southwest Power Interchange Committee is a cooperative and advisory association whose membership includes representatives of municipalities, utility districts, private utilities, and state and federal bodies as follows: California Electric Power Co., Central Arizona Light & Power Co., City of Burbank, City of Glendale, City of Los Angeles Department of Water & Power, City of Pasadena, Imperial Irrigation District, Metropolitan Water District, Pacific Gas and Electric Co., Public Utilities Commission of the State of California, San Diego Gas & Electric Co., Southern California Edison Co., and U. S. Bureau of Reclamation, Boulder City.

Through the medium of bimonthly meetings, the members are kept advised of electric power supply conditions through the area. Excellent cooperation is obtained in coordinating overhaul schedules, sharing reserves and providing assistance during emergencies and effecting operating economies between systems individually and through the efforts of the committee.

The committee was organized generally in its present form in 1942, and through an operating subcommittee and task force, has compiled power supply statistics for the area and prepared load and resource estimates for the use of its members and other interested parties. During World War

Table II—Statement of New Generating Capacity Scheduled for Service During 1951-1954 Inclusive

System	Plant Name	Plant Location	Capacity — MW Name Plate		Capacity — MW Operating	Expected Dates Operating
So. Calif. Ed.	Big Creek 4	Fresno County	42	(H)	42	June 1951
So. Calif. Ed.	Big Creek 4	Fresno County	42	(H)	42	July 1951
So. Calif. Ed.	Etiwanda	San Bernardino Co.	100	(T)	125	Dec. 1952
So. Calif. Ed.	Etiwanda	San Bernardino Co.	100	(T)	125	Dec. 1952
So. Calif. Ed.	New Plant	Not Located	125	(T)	150	Jan. 1954
So. Calif. Ed.	New Plant	Not Located	125	(T)	150	Jan. 1954
San Diego G&E	Silver Gate	San Diego	50	(T)	60	Oct. 1952
San Diego G&E	Encina	San Diego	80	(T)	100	Sept. 1954
Calif. Elec. Power	Highgrove	Riverside County	30	(T)	33	July 1952
Calif. Elec. Power	Highgrove	Riverside County	30	(T)	33	Sept. 1952
Calif. Elec. Power	Highgrove	Riverside County	40	(T)	44	Jan. 1954
Los Angeles Dept. of W&P	Valley	Los Angeles	80/100	(T)	80	Sept. 1953
Los Angeles Dept. of W&P	Valley	Los Angeles	80/100	(T)	80	Dec. 1953
Los Angeles Dept. of W&P	Owens Gorge		37.5	(H)	37.5	Aug. 1951
Los Angeles Dept. of W&P	Owens Gorge		37.5	(H)	37.5	Aug. 1951
Los Angeles Dept. of W&P	Owens Gorge		37.5	(H)	37.5	Apr. 1952
Burbank PS Dept.	Burbank	Burbank	30	(T)	30	Nov. 1952
Glendale PS Dept.	Glendale	Glendale	20	(T)	20	Oct. 1952
Pasadena L&P Dept.	Pasadena	Pasadena	40	(T)	40	Jan. 1954
Tucson GL&P	Tucson	Tucson	25	(T)	25	Sept. 1952
Imperial Irrig. Dist.	El Centro	El Centro	30	(T)	30	Apr. 1952
Imperial Irrig. Dist.	Drop 2		10	(H)	10	July 1952
Central Arizona L&P	Phoenix	Phoenix	60	(T)	66	May 1954
Salt River Valley P Dist.	Chandler	Chandler	30	(T)	33	June 1952
Salt River Valley P Dist.	Chandler	Chandler	60	(T)	66	June 1954
Arizona Edison	Casa Grande	Casa Grande	15	(T)	15	Apr. 1953
Arizona Edison	Casa Grande	Casa Grande	15	(T)	15	Apr. 1954
USBR	Hoover (A-4)	Hoover Dam	82.5	(H)	90	Dec. 1951
USBR	Hoover (A-3)	Hoover Dam	82.5	(H)	90	Mar. 1952
USBR	Hoover (A-9)	Hoover Dam	50	(H)	50	Dec. 1951
USBR	Davis 1	Davis Dam	45	(H)	45	Jan. 1951
USBR	Davis 2	Davis Dam	45	(H)	45	Apr. 1951
USBR	Davis 3	Davis Dam	45	(H)	45	Apr. 1951
USBR	Davis 4	Davis Dam	45	(H)	45	May 1951
USBR	Davis 5	Davis Dam	45	(H)	45	June 1951
PG and E	Bear River	Salt Springs	33	(H)	33	Mar. 1953
PG and E	Moss Landing	Moss Landing	100	(T)	100	Feb. 1951
PG and E	Moss Landing	Moss Landing	100	(T)	100	Jan. 1951
PG and E	Moss Landing	Moss Landing	100	(T)	100	June 1952
PG and E	Moss Landing	Moss Landing	100	(T)	100	Oct. 1952
PG and E	Contra Costa	Contra Costa County	100	(T)	100	May 1951
PG and E	Contra Costa	Contra Costa County	100	(T)	100	June 1951
PG and E	Contra Costa	Contra Costa County	100	(T)	100	July 1951
PG and E	Contra Costa	Contra Costa County	100	(T)	100	May 1953
PG and E	Contra Costa	Contra Costa County	100	(T)	100	Feb. 1953
PG and E	Not Determined		125	(T)	125	Jan. 1954
PG and E	Not Determined		125	(T)	125	Feb. 1954
PG and E	Not Determined		125	(T)	125	Mar. 1954
PG and E	Not Determined		125	(T)	125	Apr. 1954

(H) Hydraulic (T) Thermal

II, the committee's reports were used by the War Production Board as an authoritative source of information on the adequacy of the electric power supply in the area. The cooperative pooling of all the power resources of the area made it possible to meet the abnormally high demands arising during World War II. The committee remained active during the postwar period of expansion and continues to represent the electrical generating and distributing member agencies, prepares load and resource studies and performs such other functions as are best carried out on an area basis.

The Pacific Southwest power area is divided into four subareas to facilitate the preparation of statistics. The utilities' systems included in each subarea were selected either because of geographic proximity or because their interconnection facilities and contract arrangements made a logical grouping. The subareas have been designated as A, B, C, and D and are shown schematically in Fig. 1.

The two graphs in Fig. 2 showing kilowatt peaks and kilowatt-hours generated illustrate the unprecedented increase in the demand for electric power that has occurred in the Pacific Southwest area since October 1943 when the committee began compiling monthly records. These graphs are historical to May 1951 and are estimates from this date through 1954. Fig. 2 shows that in December 1943 the peak demand was 3.6 million kw and that it increased to 5¾ million kw in December 1950, an increase of 59%. The maximum area peak demand in 1954 is estimated at 8¼ million kw (8,636 mw by latest estimate), an increase of 44% above the 1950 peak and 129% above the 1943 peak. Fig. 2 also illustrates the monthly energy generation in kilowatt-hours and the annual generation on a 12-month ending basis. In 1944, 22.9 billion kwh were generated, 31½ billion kwh were generated in 1950, and up to 45½ billion kwh are estimated for 1954, an average increase of approximately 2¼ billion kwh per year for the 10-year period.

Because of the limitations placed

Table III—Pacific Southwest Power Area Capacity and Energy Margins Between Resources and Loads

Estimates as of Sept. 19, 1951

	Current Average Hydro	1952 Adverse Hydro Aug.	1952 Adverse Hydro Dec.	1952 Average Hydro Aug.	1952 Average Hydro Dec.	1953 Adverse Hydro Aug.	1953 Adverse Hydro Dec.	1953 Average Hydro Aug.	1953 Average Hydro Dec.	1954 Adverse Hydro Aug.	1954 Adverse Hydro Dec.	1954 Average Hydro Aug.	1954 Average Hydro Dec.
Net capability (mw)	7,695	7,695	7,889	8,014	8,212	8,300	8,639	8,664	9,039	9,612	9,983	9,921	10,433
Estimated load (mw)	6,640	7,319	7,456	7,280	7,460	7,915	8,058	7,877	8,061	8,498	8,636	8,461	8,637
Net margin (mw)	950	376	433	734	752	385	581	787	978	1,114	1,347	1,460	1,796
% Net margin	14.3	5.1	5.8	10	10	4.9	7.2	10	12	13	15.6	17.3	21
Net energy available (millions kwh)	3,652	3,949	3,673	4,285	4,083	4,325	4,274	4,711	4,569	5,214	5,118	5,537	5,430
Estimated load (millions kwh)	3,043	3,854	3,386	3,847	3,398	4,180	3,676	4,175	3,688	4,479	3,932	4,474	3,943
Net margin (millions kwh)	609	95	287	438	685	145	598	536	881	735	1,186	1,063	1,487
% Net margin	15	2.5	8.5	11.4	20	3.5	16	13	24	16.4	30	24	38

Note: Net capability is total available to the area less scheduled maintenance outages. Net energy available is likewise the net for the area less kwh generation lost from machines out for scheduled maintenance.

upon the use of critical materials and the manufacture of generating equipment during World War II, only a minimum of additions to generating capacity was made in the area during the period 1942 to 1947. Consequently, reserves were largely used up and a tremendous program of installing new generating capacity was started and is still in progress.

Table I summarizes the generating capacity installed during the four years 1947-1950 and that scheduled for the four-year period 1951-1954. Table II lists in detail the scheduled increases in generating capacity for 1951-1954, the expected operating dates, and the generating agencies making the installations.

The generating capacity in the area on Dec. 31, 1946, totaled 4,960,000 kw. During the four-year period 1947-1950, 2,086,000 kw were added. From 1951-1954, 3,302,000 kw of generating capacity are scheduled for installation in the Pacific Southwest area. Summarizing this eight-year period 1947-1954, the 5,388,000 kw of generating capacity which either have been installed or are planned for installation is more capacity than was placed in service during the life of the electrical industry in this area prior to 1947.

Preparation of Load and Resource Estimates

Certain assumptions were made in preparing the studies for DEPA and the commission loads and resources. They included the following:

The load estimates for the area are the sum of estimates made by the individual utilities and agencies comprising the Pacific Southwest area. The estimates are based on a relatively high level of civilian use with substantial allowance for new and converted defense industry. A full-scale war economy was not assumed. Relatively high industrial load factors, because of a change from one-shift to two-shift operations, were assumed, when applicable, which is comparable to conditions between 1943 and 1945. No allowance was made for large blocks of load for electrochemical processes and production of light metals except for existing and definitely planned installations. The bulk of the increased demands caused by the defense effort was assumed to occur in 1951 and 1952; this results in estimated increases in 1951 and 1952 somewhat higher than the substantial annual increases that have occurred since 1946 with a smaller rate of increase for 1953 and 1954.

It was assumed that Daylight Saving Time extending from the last Sunday in April to the last Sunday in September, each year, would continue in force without change through the report period.

Experienced members of the operating staff of each of the generating agencies made detailed load and resource estimates for their respective utility under the same assumptions. These estimates were then combined under the supervision of the task force for the interchange committee, to make the subarea and Pacific Southwest power area estimates. The loads and resources of the agencies within and between subareas were then integrated only to the extent necessary to cover deficits. Such integration or pooling of resources was controlled by availability of margins and tie-line capacity without regard to contractual limitations. This information indicates that under the assumptions made with

Table IV—Pacific Southwest Power Area Estimated Fuel Use

	Equivalent to Barrels of Oil Adverse Hydro Conditions	Average Hydro Conditions
1951 (Current outlook)	31,905,000 Bbl.	
1952	51,911,000 Bbl.	38,718,000 Bbl.
1953	55,590,000 Bbl.	41,609,000 Bbl.
1954	58,804,000 Bbl.	46,336,000 Bbl.

Estimated 5,500 cu. ft. of gas for each barrel of fuel oil.
No estimate of gas quantities is available.

Construction is going forward on Southern California Edison's Etiwanda steam station, which will go on the line in late 1952

pooling of resources, there will be sufficient generating capacity installed or scheduled for installation to carry such estimated demands for the four-year period 1951-1954.

Margins

Results of the latest study on capability and energy margins between resources and loads are given in Table III. This indicates several margins ranging around 5% in capability to meet demands, and one as low as 2.5% and another only 3.5% in kwh reserve over energy requirements. Such reserves as are shown are not dependable because they must cover (1) capacity and energy production out of service from emergencies or breakdowns and (2) reserve for demands in excess of the load estimates and the spinning or contingency reserve. Moreover, as first stated, the whole study is based upon equipment and material delivery schedules as promised by suppliers as of the time of the study.

With respect to delivery of new generating equipment, H. A. Lott, chairman of the Pacific Southwest Power Interchange Committee, at the latest commission hearing said, "There is a consensus among the member agents that the strongest representation from the area will be necessary to prevent further delays in the scheduled shipment of essential electric generating facilities. Threatened delays in shipment are increasing and there has been some slippage in promised deliveries. Reports from governmental agencies in Washington anticipate increasing shortages of critical materials with the probability that some of the generating equipment now on order will be substantially delayed in shipment. . . . Representatives of DEPA are becoming increasingly concerned and we must recognize the possibility of delays in delivery."

At the same hearing, W. N. Johnson, vice-president, Southern California Edison Co., said, "If the essential basic raw materials are not sufficient to continue the peacetime economy, to support the armament program, and to supply the requirements of the electrical manufacturing industry necessary to meet the power requirements of the national economy, it is self-evident that some part of the total program must be curtailed or deferred. The decisions as to what part of such total program is to be curtailed or deferred or when such effects are to take place are entirely outside the control of the electrical industry, and my company is unable to forecast the extent of the possible effects thereof."

This same study also shows that the capacity available from hydro plants is 444,000 kw less in a dry year than in an average water year. The 444,000 kw reduction in capacity is caused by head loss at storage hydro plants and loss in the "stream flow" or "run-of-the-river" plants. The energy generated by hydro plants is reduced from 22 billion kwh in an average water year to 16.6 billion kwh in a dry year, a reduction of approximately 5½ billion kwh.

In a dry year steam generation must be substituted for hydro generation and it would require 900,000 kw of steam generation operating at a load factor of 70% to produce the 5½ billion kwh deficit. A substantial part of the 900,000 kw required to generate such a deficit also represents hydro generating capacity that is unusable except for spinning reserve and short-time emergency because of the lack of supporting energy or shortage of water. When the reduction in capacity of the hydro plants, because of loss of head, is added to the hydro capacity made idle because of shortage of water, it is apparent that a substantial part of the area's hydro generating capacity cannot be used to supply the area load in a dry year. Therefore, capacity alone is not a true measure of the power supply in the area. The ability to produce energy must also be considered. Unusable or idle capacity at storage hydro plants is one of the factors affecting Pacific Southwest area resources, which is most difficult to understand by those who are not familiar with the wide variations in

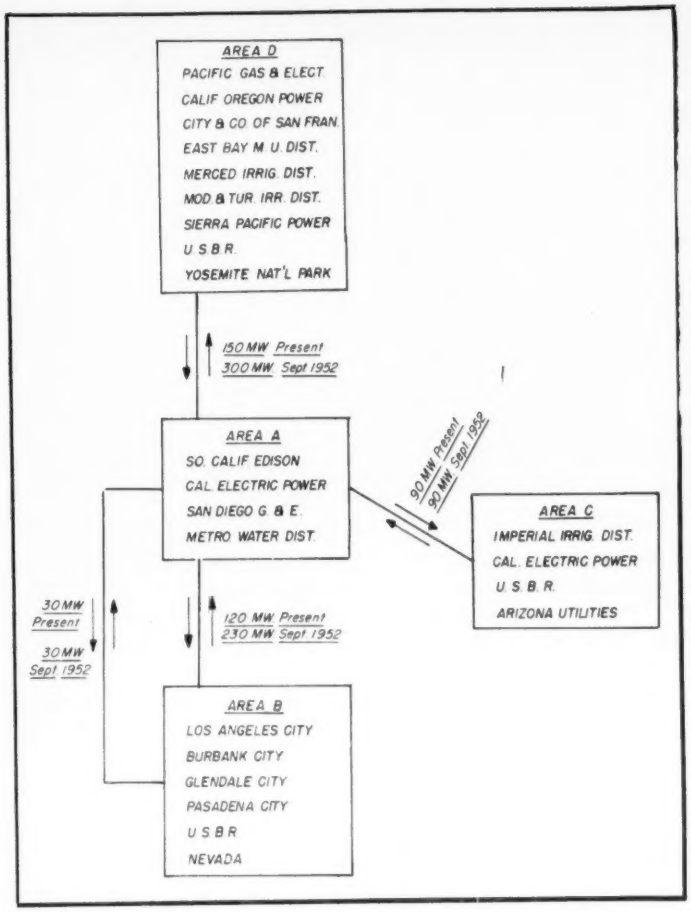
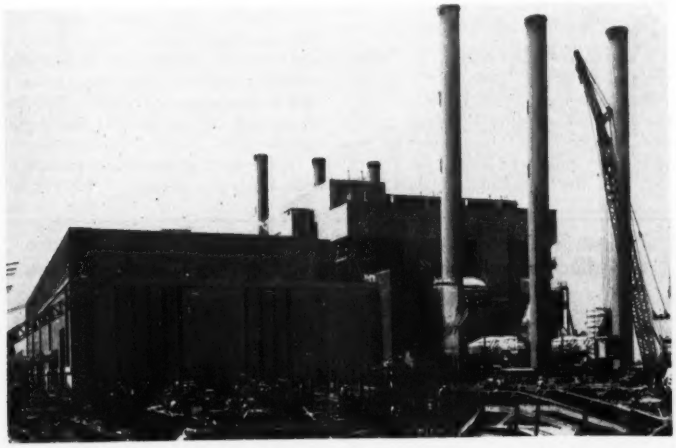


Fig. 1—Diagram of present, future interchange capacity between Southwest groups



Steam plants such as this 200,000-kw Contra Costa extension are an important part of PG and E's postwar program. Just announced is a new 600,000-kw plant at Pittsburg

the runoff from Western streams.

The effects of dry years similar to 1924, 1931, 1934 and 1939 are of very serious import to the area. Furthermore, the distribution and form of precipitation during any year has an important bearing. Hydro plant production in a year when several medium winter storms deposit snow on the watersheds is usually substantially better than the production in a year when winter storms consist of warm rains even though they may be of flood intensity. The predicted hydro production for the year 1951 will vary from above average in limited areas in northern California to below average in central and southern California. Firm power only is predicted for Colorado River plants and dry year conditions prevail in Arizona. Adequate reserves or margins must be maintained to meet dry years.

In addition to reserves for dry years, consideration must be given to the fact that in excess of 300,000 kw of fuel generating capacity included in the area resources has been in service more than 25 years. Obviously under high load factor operation, it must be expected that a great deal of unscheduled maintenance will be required. Adequate reserves must be provided to cover such contingencies.

Fuel Requirements

Reference to Table I will show that on Dec. 31, 1946, only 34% of the total generating capacity in the area was in fuel plants. During the period 1947-1950, 69% of the generating capacity was in fuel plants and 79% of the new generating capacity scheduled for installation during the years 1951-1954 is in fuel plants. Fuel plants will constitute 55% of the total generating capacity in the area by the end of 1954. Table IV tabulates the fuel which it is estimated will be required for 1951 and for 1952, 1953 and 1954 under both average hydro and dry year conditions.

It is estimated that the equivalent of 31.9 million bbl of fuel oil will be required for 1951; this will increase under the assumptions made to a use of 46.3 million equivalent barrels in 1954, if 1954 is an average water year, and to 58.8 million equivalent barrels in 1954, if 1954 is as dry as 1931. The interchange committee is not in a position to estimate the breakdown between fuel oil and fuel gas. However, it is assumed that fuel will be available to supply the requirements.

Finally and for emphasis, it should be repeated that if the planned addi-

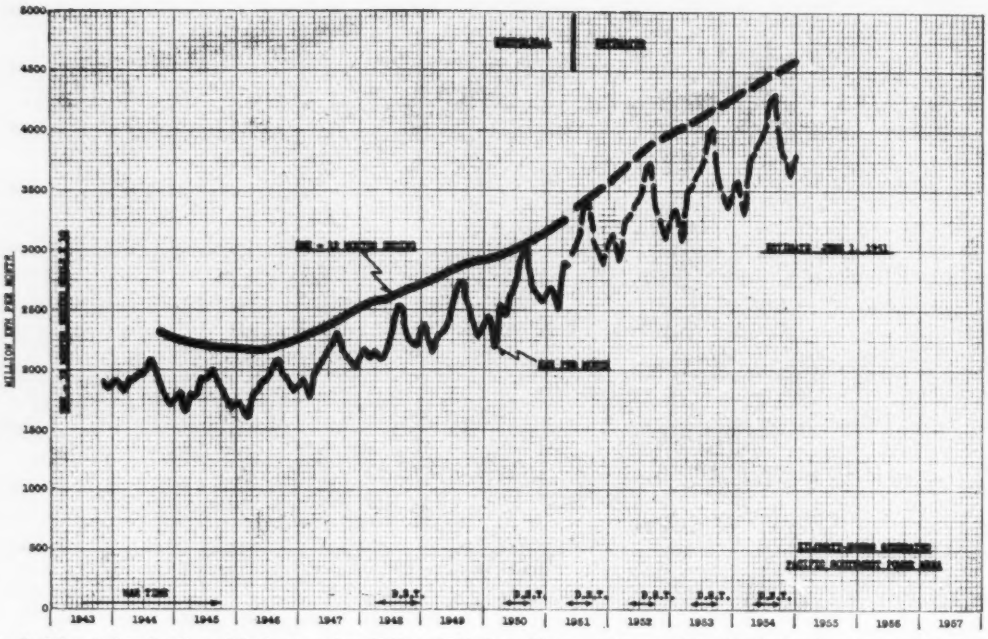


Fig. 2—Historical and estimated kwh generation, 1943 to 1954, for utility agencies comprising Pacific Southwest power interchange

tions to generating capacity are appreciably delayed or if for other reasons the units on order are not made available to the member utilities for installation on their scheduled dates, the interchange committee does not believe there will be sufficient resources to serve adequately such estimated demands.

Wyoming-Colorado Area Expects No Trouble

Utilities in the Wyoming-Colorado-New Mexico area will be able to meet the demands of present customers and to take care of normal load increments, including defense mobilization requirements, provided presently programmed expansion plans proceed according to schedule. This is brought out in a study of the power supply situation for the area for the years 1951-1954 inclusive.

The region embraced by these three states is a large geographic area with a very low population density. As a consequence it does not have a completely integrated power supply system as do other areas of the Far West, but instead is served by a number of isolated systems. The accompanying table presents data for the following systems: U. S. Bureau of Reclamation Colorado-Wyoming facilities and interconnected Wyoming utilities; Public Service Co. of Colorado; Southern Colorado Power Co.; Western Colorado Power Co.; City of Colorado Springs Municipal Light Dept.; and Public Service Co. of New Mexico.

Only two of these systems are interconnected at the present time—the Public Service Co. of Colorado and the USBR Colorado-Wyoming facilities. However, an interconnection between the Southern Colorado Power Co. and the Colorado Springs municipal utility is scheduled for early construction.

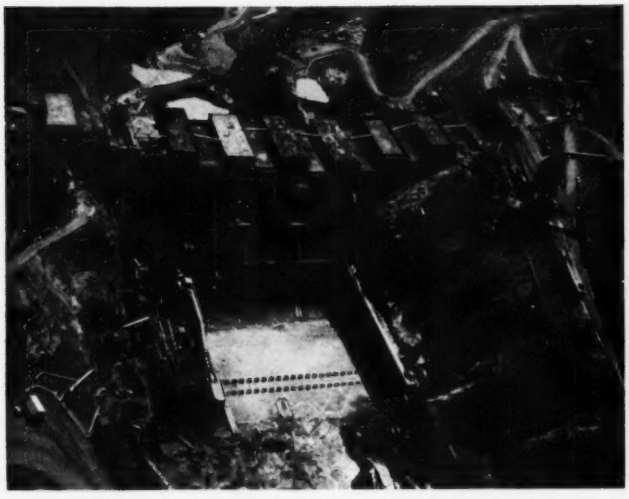
For the four-year period under consideration the utilities listed plan to add a total of 466,000 kw in new generating capacity. This represents a 72.4% increase over the 631,000 kw of capacity in the area at the beginning of 1951.

Based upon reasonable estimates of peak loads the margin of reserve for

Power Supply Situation of Wyoming-Colorado-New Mexico As Reflected by Major Power Suppliers of the Three State Area

(All Values in Megawatts)

	1951	1952	1953	1954
Capability at beginning of year indicated	631	760	810	1,012
Plant additions during year	129	50	202	85
Capability available to meet annual peak	760	810	1,012	1,097
Annual peak load	639	723	823	925
Margin of reserve	121	87	189	172
Per cent reserve	18.9	12.0	23.0	18.6



Detroit Dam spillway on North Santiam River (Army Engineers) and Hungry Horse Dam (USBR) on South Fork of Flathead River

the area will range from 87,000 kw to 189,000 kw and the percentage of reserve will vary from a low of 12.0 in 1952 to a high of 23.0 in 1953.

To some extent these figures are misleading because of the isolated nature of some of the systems and the lack of interconnections to make reserve capacity available from one area to another. However, unless unprecedented and unforeseen demands for special defense loads should develop in an isolated area, the planned expansion program should prove adequate. This presupposes that the various agencies concerned with material allocations do not change the present schedules.

Intermountain Group Has Slim Margin

There will be ample margins of generating reserves over foreseeable loads in the Montana-Idaho-Utah area for the 1951-54 period. That fact is evident from a Defense Electric Power Administration report dated Sept. 1 for the subregion comprising the eastern group of the Northwest Power Pool. Included is Montana except east portion, Idaho including eastern Oregon loads, and north-central Utah. Utility systems included are Montana Power Co., Idaho Power Co., and Utah Power & Light Co.

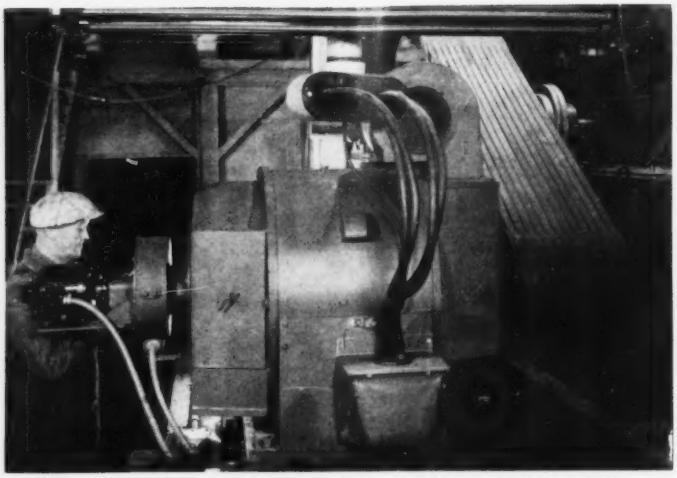
The DEPA report gives monthly estimates for the years 1951 to 1954, inclusive, for both median and adverse water conditions. Worst conditions shown are for September and October of this year when net margin of capability over load is given as 1% and 1.8%, respectively. Energy reserves, on the other hand, for these two months are 14.7% and 11.3%. Thereafter, through 1954, peaking reserves for critical water conditions appear ample. They range from as low as 5.9% for December 1951 to as high as 24%. Energy reserves for the same period range 5.4% in July of 1953 to 28.7% in May 1954.

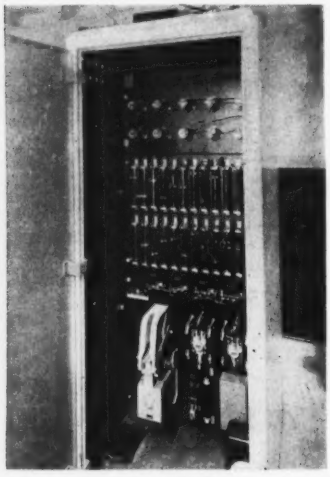
Margins available in this eastern pool group, if not needed to cover new loads, are available to the western group within transmission line limitations. All available sources of generation were considered regardless of production cost. Surplus energy would be principally from steam plants at nights and on week ends.

Estimates were based on large foreseeable new defense loads. These included 55 mw in 1952 for electric furnaces for phosphorus production and another 55 mw for the same purpose in 1954. In addition, load at the AEC reactor testing station in Idaho was estimated to reach 9 mw by December 1954. New plant additions for the four-year period under consideration are given as 408 mw as shown by the accompanying table. Total power sources available for load of the area are given as 1,007 mw for September of this year. This will have been increased 38% by the end of 1954 with the 408 mw of new generation scheduled.

System	Plant	Location	MW Rating	Scheduled Completion
Montana Power Co.	Frank Bird	Billings	66 (S)	Nov. 1951
USED	Fort Peck	Fort Peck	35 (H)	Oct. 1951
Idaho Power Co.	C. J. Strike	Grandview	27.5 (H)	Jan. 1952
Idaho Power Co.	C. J. Strike	Grandview	27.5 (H)	Feb. 1952
Idaho Power Co.	C. J. Strike	Grandview	27.5 (H)	Mar. 1952
Utah Power & Light Co.	Gadsby	Salt Lake City	75 (S)	Oct. 1952
Idaho Power Co.	Site L	Bliss	20 (H)	April 1953
Idaho Power Co.	Site L	Bliss	20 (H)	June 1953
Idaho Power Co.	Site L	Bliss	20 (H)	Aug. 1953
Montana Power Co.	Kerr	Polson	56 (H)	Oct. 1953
Idaho Power Co.	Oxbow	Homestead, Ore.	35 (H)	Nov. 1954
			408	

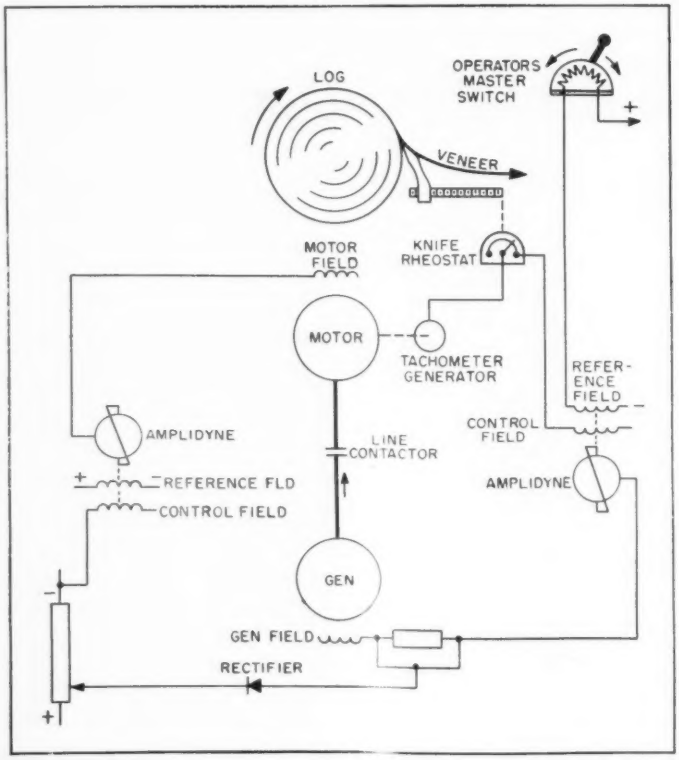
S—Steam H—Hydro





Variable speed 75/100-hp lathe drive motor (left) with blower and tachometer generator. At right: Floor mounted main control panel

Amplidyne Control for Veneer Lathe Drive



Amplidynes are controlled by master rheostat, knife rheostat and tachometer generator

W. D. Vincent and Fred Thompson

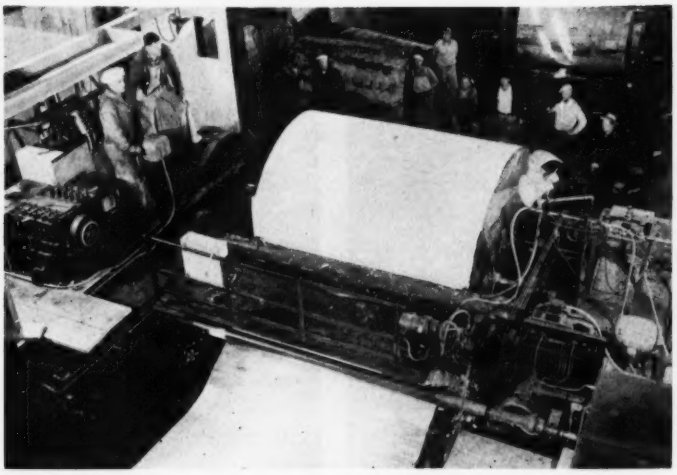
General Electric Co.
Seattle

Electric drive replaces steam. Constant sheet speed is held automatically for each position of master control rheostat

Steam engines have been the most popular motive power for the veneer lathes in plywood plants until the advent of a successful electric drive. In recent years the need has arisen for an electric drive to reduce steam consumption, provide greater control of speed and permit the use of an automatic control of both the lathe and associated tipple and tray drives. To meet these requirements an adjustable-speed d-c drive was developed using amplidynes (a type of rotating amplifier) for excitation of both motor and generator fields.

These amplidynes, under control of a master speed rheostat, tachometer generator, and a rheostat driven from the knife mechanism, provide constant veneer sheet speed (fpm) held automatically at each position of the master rheostat, quick stopping when needed, reversing at a preset low speed, and limitation of maximum armature current to a safe value.

Most of the thin veneer plies are



Lathe showing veneer being carried away on the tipple. Original log diameter was 114 in.

produced by the "rotary cut" method on veneer lathe. The cutting is accomplished by revolving the log against the knife, the veneer being peeled off in a continuous sheet. The knife is slowly moved toward the log by an automatic, geared transmission driven from the lathe shaft so as to maintain constant veneer thickness. A typical veneer lathe installation feeds the sheet of veneer peeled off the log on to a swinging "tipple" conveyor to storage trays before it is clipped to size and passed to the next operation.

Veneer Lathe

The main veneer lathe is a massively constructed piece of machinery designed to handle the large "peeler" type of log. In some localities, these logs may be as large as 110 in. in diameter, cut to lengths of from 100 to 150 in. The average Douglas Fir peeler log will be 40 to 50 in. in diameter and approximately 100 in. long. Rotating the log against a long, sharp knife causes a thin sheet of veneer to be peeled. This knife continually moves toward the center of a log at a rate proportional to the lathe rpm. The resulting veneer thickness depends upon the gear ratio between the knife mechanism and the lathe indriving shaft. This ratio may be changed so the lathe can peel any standard veneer thickness.

A standard line of electric lathe drives has been laid out including sizes covering the requirements of most lathes in use today. The accompanying tabulation shows the nominal drive equipment ratings.

In applying a veneer lathe drive, it is extremely important to match the drive rating with the purchaser's operating requirements. The actual horsepower required by a lathe is affected by several factors, some of which are variable and indeterminate. In general, power consumption depends upon the kind of wood being cut, the condition of the wood, including moisture content (whether soaked or steamed previously), grain structure, number and hardness of knots, type and sharpness of knife, length of log, thickness of cut and linear sheet speed.

Amplidyne Control

Basic simplicity of the control scheme is shown by the one-line diagram on page 76. A voltage proportional to linear sheet speed is obtained through the unique utilization of the knife-operated rheostat in conjunction with a motor-mounted tachometer generator.

This voltage is compared with a reference voltage determined by the position of the master speed rheostat. The error voltage is fed to two amplidynes to regulate the speed of the motor by changing the field excitation of both generator and motor.

With a large log in the lathe, the knife rheostat taps off most of the tachometer voltage so that only a small total tachometer voltage is required to make the tapped portion match the reference voltage. Thus, the regulator calls for full motor field and a low generator voltage. As the log diameter decreases, the knife rheostat taps off less of the tachometer voltage, so to balance the reference voltage the tachometer generator must be speeded up. To increase speed the generator voltage is increased until it reaches about 80% of its rated value with the motor field held at its full field value. As the generator voltage increases from 80 to 100%, the motor field is automatically weakened in proportion down to its minimum value.

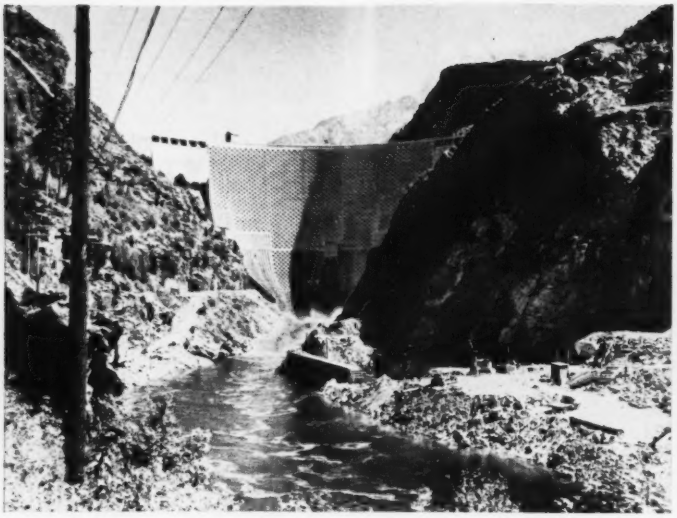
A line contactor and an "off" push button provide for locking out the drive if desired. For normal stops to change logs, using the master switch, the line contactor does not drop out. In fact, only one small relay operates with each step, so contact wear and maintenance are almost eliminated.

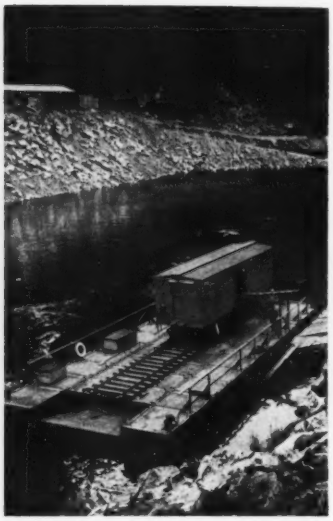
In actual use, the new lathe drive has speeded operation, reduced waste and bettered the quality of the veneer. General acceptance of the drive is indicated by the fact that a number of additional drives have been sold since the first successful installation. This new development is another forward step in the electrical industry's efforts toward the better utilization of our timber resources.

Veneer Lathe Drives

(Nominal—230-v motor ratings and 250-v generator ratings)

Equipment Number	Lathe Motor hp	Lathe Motor rpm	Generator kw	AC Motor hp
1	15/20	575/1800	20	30
2	20/25	575/1800	25	40
3	25/30	575/1800	30	50
4	30/40	575/1800	40	60
5	40/50	575/1800	50	75
6	50/60	500/1500	60	100
7	60/75	500/1500	75	125
8	75/100	500/1500	100	150
9	100/125	500/1500	125	200
10	125/150	500/1500	150	250





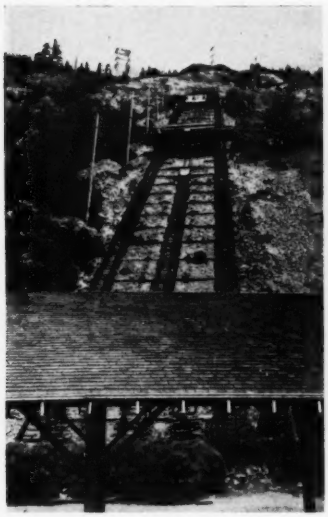
Spectacular Ross Dam (left) rising 540 feet will impound 1,400,000 acre-ft. Right: All equipment is conveyed by barge to Ross Dam

Skagit Will Be Low-Cost Hydro

Ross power house site just below dam. Initial installation will be three 90,000-kw units

The Skagit project of Seattle City Light is unique in many respects among West Coast hydro projects. The project is now nearing completion with construction well under way on Ross power house. Ross will have three 90,000-kw units initially and a fourth ultimately. First of the three units is scheduled for December 1952 with the others coming in at 90-day intervals. Ross is the third and final plant in the Skagit project. Cost of Ross Dam and three-unit Ross power house will be $68 million. Figuring incremental cost of the fourth generator, the capital unit cost will be less than $200 per kilowatt of installed capacity.

Development of the Skagit River was begun in 1919 with the building of a low diversion dam and the Gorge power house that was placed in service in 1924. Capacity of this plant initially was 40,000 kw with two units. The capacity was increased to 60,000 kw in 1929 by the addition of a third unit. A fourth unit was placed in service in June of this year increasing the capacity to 108,000 kw. This plant is designed for a head of approximately 100 ft higher than is used at present and when the ultimate is gained by the construction of a high dam at the plant intake the

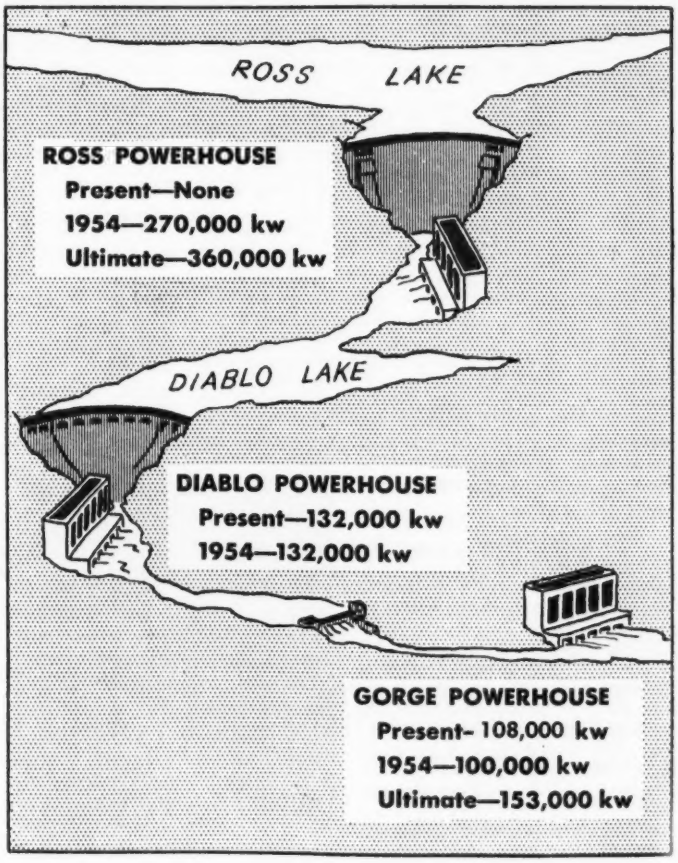


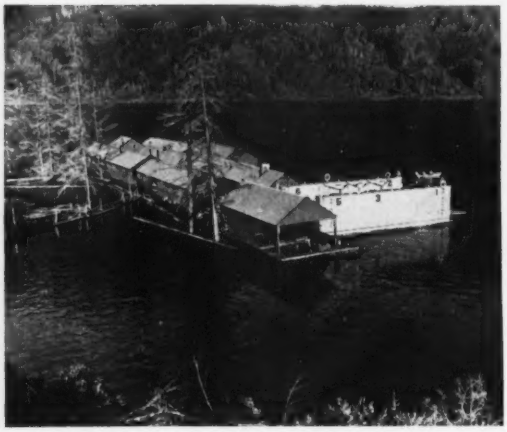
Inclined railway (left) lifts freight cars to Diablo Lake level where they are barged to Ross Dam. Right: Upstream view of Ross Dam

capacity will be increased to 153,000 kw. Next step in the development was the Diablo Dam and power house seven miles upstream, completed in 1936.

Diablo has two 65,000-kw units. This was followed by construction of 540-ft-high Ross Dam five miles above Diablo, at a cost of $30 million, with reservoir storage of 1,400,000 acre-ft. Ross power house, now being built, is just below Ross Dam.

Uniqueness of the Skagit project arises from the rugged and mountainous terrain of the region. It is probably the roughest country to be found in the Cascade mountain range. The Skagit River canyon above Diablo Dam is so rocky and precipitous that it was practically out of the question, economically, to build a railroad or trucking road to Ross Dam site. Instead, all of the great quantities of materials to build Ross Dam were transported by barge on the lake created by Diablo Dam. This five-mile 90,000 acre-ft reservoir extends to the base of Ross Dam and will serve also for transporting all of the materials and heavy equipment required for Ross power house. An electric rail line owned by the city ends at Diablo power house. From here, railroad cars are lifted 300 ft by inclined railway to the level of Diablo reservoir. Electric locomotives haul the cars half a mile up to the lake, where they are run onto barges. The barges are then towed up the lake to Ross. Where did the heavy steel barges come from? They were trans-





Taking off by boat for seven-mile trip up Ross Lake to floating camp at right. Camp houses logging crew clearing shores of lake

ported in sections and welded together on the lake shore.

Transportation above Ross Dam is by boat also. Crews cutting timber on the lake shore and clearing the lake of logs and debris, hike up a trail that leads to the top of Ross Dam and then travel by boat up the lake to their floating camp. Food and equipment are hoisted over the dam by crane.

Ross Lake at an elevation of 1,582 ft at present will be raised to elevation 1,600 ft later by the installation of 18-ft gates on the dam, and as previously mentioned will have a storage of 1,400,000 acre-ft. The 20-mile lake extends to the international boundary and even 1½ miles into Canada.

The project is most interesting and the country is a scenic gem as evidenced by the accompanying photographs taken by an ELECTRICAL WEST editor while on a two-day inspection trip recently as the guest of John Nelson, assistant superintendent of Seattle City Light.

Ross Dam

Ross Dam is one of the most spectacular in the West. Rising 540 ft in precipitous Skagit canyon, it is an imposing structure. Downstream side of the dam was provided with a waffle-like face as shown so that the dam can later be raised another 125 ft. This would raise the lake to elevation 1,725 ft and provide an additional storage of 2,060,000 acre-ft. Present usable draw-down on the reservoir is 282 ft from elevation 1,582 ft to elevation 1,300 ft. containing 1,195,000 acre-ft equivalent to 635 million kwh when used through the Diablo and Gorge plants below. After Ross plant is brought in the draw-down will be 125 feet from elevation 1,600 ft providing 1,025,000 acre-ft equivalent to 840 million kwh when used through all three plants. Such storage is of immense benefit to resources of the 4,900,000-kw Northwest Power Pool, of which Seattle City Light is one of the ten generating members.

The Ross power house will be the largest nonfederal plant in the Pacific Northwest. Provision is made for four 90,000-kw generators. Only three units are now being installed. The fourth unit will depend largely upon what happens to the Bonneville wholesale power rate of $17.50 a kilowatt-year when it again comes up for review in 1954.

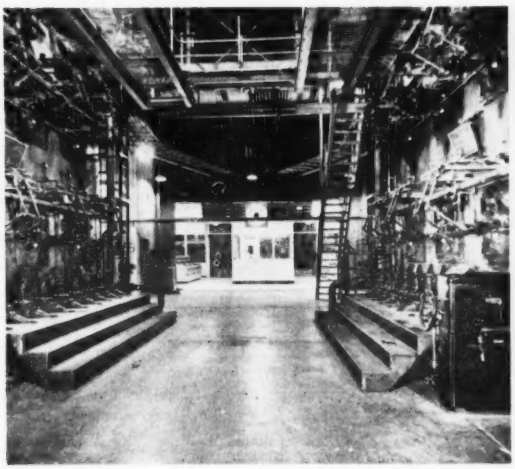
View from Ross Dam showing the canyon

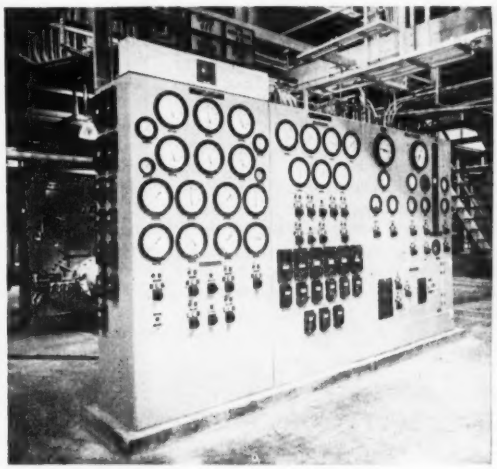
The present generators will be supplied by the Westinghouse Electric Corp. and will be driven by 120,000-hp Baldwin Francis-type turbines. Four 16-ft penstocks, merging into two 24½-ft penstocks passing through tunnels in solid rock will provide a static head of 395 ft. Power from a common 13.8-kv generator bus will feed two banks of three 70,000-kva General Electric transformers each, thence without high-side switching, over a steel tower two-circuit 230-kv line, to a ring bus at the Diablo plant switchyard. From here a new steel-tower two-circuit 230-kv line is being built 87.4 miles to Bothell substation north of Seattle. This is a new station having fourteen 230-kv positions. Here intertie is made with the Bonneville Power Administration system.

The canyon below Ross power house is so steep and rocky that it looks as though the contractor building the line will have to use "sky hooks" to gain access to tower locations.

Penstock tunnels are now practically completed at Ross; cofferdam for the power house is complete and work is starting on the plant substructure. As previously stated, the first unit is scheduled for December 1952. Completion of Ross will be of great economic benefit to the City of Seattle, particularly since it recently acquired the Seattle city distribution system of the Puget Sound Power & Light Co. with a demand of about 200,000 kw. Ross will enable Seattle City Light to cut back on its power and energy requirements from the federal generating system thus making more power available to other utilities and industries in the Northwest.

Turbine room (left) showing new low-type boiler feed water pumps. Right: Packaged 100-kva induction regulator dry-type light unit





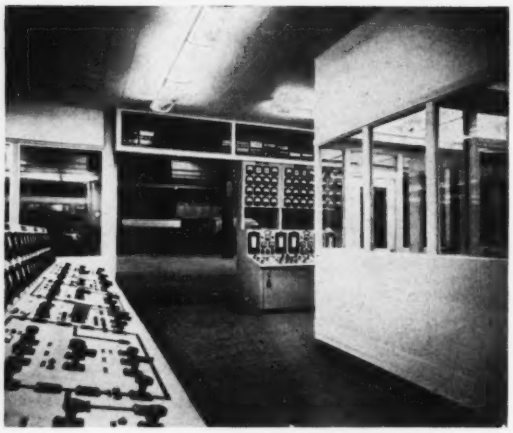
Boiler firing isle (left) is in full view of operator in control room at rear center. Right: Typical boiler auxiliary control board

Contra Costa Is Highly Instrumentated

Centralized control, low-type feed water pumps and short cuts in construction feature 300,000-kw PG and E steam plant

New 300,000-kw Contra Costa steam plant, located at Antioch near San Francisco, like other recent Pacific Gas and Electric Co. plants, is an excellent example of the extent to which controls are grouped to reduce operating labor, and the degree to which instrumentation is employed in a modern steam plant. Like three predecessor plants built by PG and E since the war, all major controls are grouped in an operating center commanding a view of firing isle and turbine room. In turn, various less important controls are grouped throughout the plant.

PG and E's experience with centralized control, dating from Avon steam station built in 1940, has shown that the high degree of reliability of modern auxiliaries makes it unnecessary to bring as many controls into a central location as was first thought advisable. That is, it has been found entirely practicable to carry certain



Two views showing relation of control center to rest of plant. Left: Looking at control center from turbine room. Right: Control room

controls only to subcontrol centers.

A feature, not employed for years by PG and E, is found at Contra Costa—that of a subcontrol board located in an operating building at the high-voltage switchyard located some thousand feet from the plant. This board controls all high-tension switching, loading and frequency control of the main units, relaying, communication and certain other functions. This subcontrol point is really a subdispatching center for lines in the area and was made necessary by the growing complexity of the PG and E system. Moreover, the idea saved the high cost of carrying numerous control and instrument circuits the long distance to the power house proper.

The accompanying staff photographs show a number of the control centers mentioned above.

New Type Motor

In addition, one of the pictures shows an important new feature, found for the first time at Contra Costa. This is the use of a new low-type boiler feed water pump motor that does not obstruct vision in the main section of the plant. Two bays, with cranes, were provided to house boiler feed water pumps, house generators and main turbine-generators. Auxiliaries are located in one bay and the main units in the other. A man can stand at the control center and see every piece of equipment in the immense two-bay area.

Steam Generators

Throttle steam conditions at the plant are 950° and 1,350 psi. Six 475,000 lb/hr Combustion Engineering-Superheater Inc. boilers are connected on a header system to supply the three main turbines. Maximum capacity of the boilers is 550,000 lb/hr. Natural gas and oil are the fuels. The furnaces may be converted to burn pulverized coal also, should occasion arise in the future. Each boiler has separate stack and induced-draft fan. There is an interesting thing about the erection of these stacks. The Bechtel Corp., designing engineers-contractor for the plant, conceived the idea of completing the entire steel assembly on the ground and then by means of cranes raise the 11-ft, 200-ft long stack in one operation. The plan worked so well that it took only 45 minutes to raise a stack. The stacks were then gunited in place.

Condenser Cooling

Condenser cooling is taken from a point 400 ft out in the San Joaquin River, on which the plant is located. Here again, Bechtel construction ingenuity played a part. Sections of the two precast concrete conduits were bulkheaded and floated to place. Slings from dolphins at each end guided the pipe sections into place on the river bottom as water was slowly admitted through the bulkheads. Joints were then made by divers. This saved a tremendous amount of work as compared with alternate methods.

Main Units

Main units are 100,000-kw turbo-generators supplied by General Electric Co. These modern 3,600-rpm units are a marvel of smoothness in operation. They run so smoothly that no vibration whatsoever can be felt through the feet and legs of a person standing alongside a unit. On the other hand, a slight vibration is felt when standing on the adjacent floor section on which are mounted the centrifugal boiler feed water pumps.

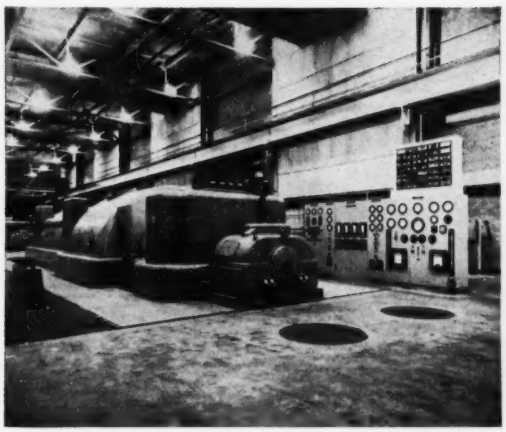
Generators are rated 129,375 kva at 80% power factor when cooled by hydrogen at 15 psig. With 30 psig of hydrogen, capability is raised to 143,000 kva. Generators are of the single-winding type, wye-connected, with neutral grounded through the primary of a 50-kva distribution transformer whose secondary is resistance loaded. Generators are connected to their associated transformer banks by a 6,000-amp, 13.8-kv, metal-enclosed, isolated-phase bus.

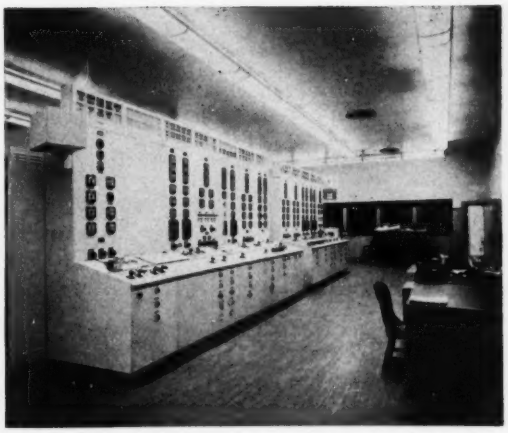
Generators are protected by high-speed differential current relays that trip the generator field breakers and close the turbine emergency stop valves. Manual disconnects only were provided in the generator bus. These permit the machine to be isolated during shut-down periods from its main transformer bank.

Control

The machine's principal controls and instruments are at the main control center. However, duplicate controls in the switchyard control house are provided, as previously mentioned, to permit the operator there to control reactive power, in addition to all high-tension switching operations. Synchronizing and control of real power is handled at the plant control center.

Station auxiliary power supply con-





Turbine-generator control boards (left) are adjacent to machines. Right: Subdispatching and control at switchyard is a revived idea

sists of unitized 4,160- and 480-v systems. An emergency fire pump and an emergency drive for the air preheater are the only auxiliaries not electrically driven. Each main unit and its associated boilers and auxiliaries has two independent sources of auxiliary power, a 10,000-kva house transformer connected to the main generator leads through an air breaker, and a 10,700-kva house turbine-generator. Normally these sources operate in parallel, with the house generator at minimum load.

These sources supply a 4,160-v ring bus for each unit. Lower voltage auxiliaries are supplied from this ring bus through two 1,000-kva transformers supplying decentralized 480-v load centers. Further stepdown for lighting and very small motors is made with a 120/208-v 4-wire voltage regulated air-cooled transformer unit.

If system trouble develops, house generators are automatically isolated and will then carry full auxiliary load free from low-frequency and low-voltage conditions. House turbogenerators are rated 7,500 kw at 70% power factor. House generator protection is the same as that for the main generators, except that on differential relay action, carbon dioxide is discharged automatically into the generators for fire protection.

Auxiliary Switchgear

The 4,160-v system consists of 60 air-circuit breakers, divided into three interconnected groups, each associated with a main generating unit. Each group incorporates two bus sections that may be connected in a solid ring.

The 480-v system consists of eight metal-clad load centers, divided into three interconnected groups, each associated with a main generating unit and provided with coordinated selective tripping. Two 1,000-kva, 4,160/480-v, oil immersed, self-cooled 3-phase transformers feed the load centers for each unit. Interunit ties provide flexibility.

Source and tie-breaker control is in a 480-v control board in the main centralized control room, where the entire system is shown on mimic bus.

Plant Lighting

Lighting service is provided by 120/208-v 3-phase circuits supplied by eight 100-kva, 3-phase, 480/120/208-v dry-type transformers. With each transformer and assembled into a package unit is a 10-kva, 3-phase, 120/208-v dry-type motor-driven induction voltage regulator. This package unit, shown in one of the accompanying photographs, was built by the General Electric Co. at the request of the Bechtel Corp. and used for the first time in this plant.

Turbine and auxiliary bay lighting is provided by dual sources consisting of one 400-w mercury lamp and one 750-w incandescent lamp. Intensity is 40-50 f-c.

Control room lighting consists of fluorescent units with Holophane controlenses. Intensity is 60-70 f-c of well-diffused glareless illumination.

In other plant areas, RLM porcelain enameled incandescent fixtures are used. Offices are lighted by commercial fluorescent units.

An astronomical-type switch controls a 5,000-v series lighting circuit installed in Transite supplying 37 m-v lamps for exterior lighting.

230-kv Switchyard

The 230-kv switchyard consists of two sections of 230-kv double bus. Each is provided with two generator breakers, one bus paralleling breaker and four transmission breakers. There are two bus-tie breakers in addition. All breakers are of the General Electric impulse type of 10 million kva interrupting capacity.

The 230-kv bus is fed by three short 230-kv lines from three banks of 35,000/43,250-kva single-phase Westinghouse transformers. No lightning protection is provided.

The control building at the switchyard houses control and relay boards, the communication and line relay carrier current apparatus and the automatic load-frequency control equipment. Carrier current equipment in the plant is supplied by the General Electric Co.

Plant Expansion

So rapidly is PG and E's load growing that even before the first unit in the plant was started, ground had been broken for a plant extension to house two more units.

In the plant extension there will be only one boiler unit, this condition being imposed by reason of the fact that reheat will be used. Boilers will have a capacity of 850,000 lb/hr and will supply steam at 1,000 F and 1,450 psi at the throttle. This will be the first time that the reheat cycle will have been employed by PG and E. The two new 100,000-kw generators (one General Electric and one Westinghouse) will have a maximum capability of 111,000 kw, the same as the present machines.

Features of new utility building include heat pump and specially designed drafting room. Right: Metal louvers control natural lighting

Operations Center Is Functionally Designed

"Operations Center," the commodious new office building of the Utah Power & Light Co. at 1359 West North Temple St. in Salt Lake, has many interesting features incorporated in its design especially to accommodate the operating departments of a public utility. Departments enjoying the conveniences of the ultra-modern functional structure include the engineering department, production and transmission department, construction and maintenance section, safety department, purchasing department and central billing office.

There are a number of features that accentuate the building functionally and rank it among the best in the West. The building is a two-story brick structure with a steel frame and has concrete floors on ribbed steel decking and open-type steel joists. The exterior architecture bears moderately toward the modern note without departing too far from the conventional and is in harmony with the company's adjacent projects —the new Gadsby steam plant and a shop and garage building. The rear wall of the office building is in common with the front wall of the recently constructed general warehouse and is provided with connecting doorway, a most convenient arrangement.

Heat Pump

Probably the most interesting of the functional features is the heating and air conditioning system. The building is provided with a heat pump, which provides heating in the winter and air conditioning in the summer. The equipment includes two 60-ton units with zone control. So versatile is the arrangement that certain zones may be operating on the cooling cycle while others are requiring heat. Such conditions will actually occur at certain times of the year when outer zones require some heat while the inner zones, less subject to heat losses, will require some cooling.

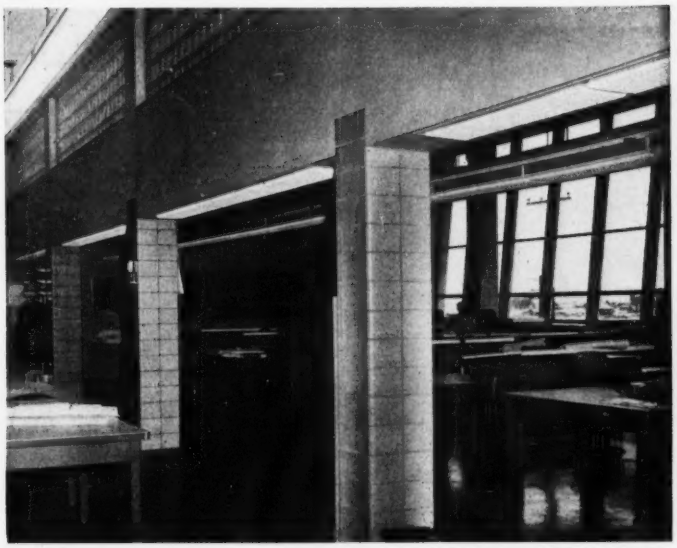
Heat source is the condensing water from the nearby new Gadsby steam plant that provides a more than abundant supply of water at an average temperature of approximately 85°. This is of course heat that otherwise must be dissipated in the large cooling towers of the plant. Indeed, this water is used directly to provide warehouse heat and radiant floor heating in the 20-stall garage building next door before entering the heat-pump system.

A 6-in. insulated supply line and an 8-in. return line run side by side a distance of about 360 ft, from a small pump house at the plant site. The lines from the pump house to the large condensing water conduits a short distance away are controlled through a valving and header arrangement so that water may be drawn from either the "hot" or "cold" conduit and returned to the alternate depending upon the season—that is, whether the cooling or heating cycle is operating.

Heating equipment in the office building comprises a split system where tempered ventilating air is supplied from a central unit through ductwork between floors and introduced through ceiling diffusers, while unit convectors with built-in fans are located in the conventional manner around the periphery. In addition to the zone control of these units each is equipped with individual manual control to give each individual or small group a certain latitude in the control of his immediate area.

General Features

The building was designed to accommodate, insofar as possible, the



Sloping ceiling in drafting room assures maximum use of natural light. Right: Stairwell with designs etched in plastic glass panels

changing requirements effected by time and functional dictates and thus to provide a high degree of versatility. To accomplish this nearly all interior partitions are steel-panel type that can be moved and rearranged with the least effort and greatest salvage. The permanent partitions such as corridor walls, toilet and utility rooms and all exterior walls are of structural tile with the inside surface finished or glazed; the color scheme includes several pastel shades. This treatment forms a permanent finish requiring no painting and a minimum of maintenance. Asphalt-tile floors in pleasing patterns and borders are employed throughout, as are acoustical-tile ceilings.

Lighting

The lighting is, in general, effected with continuous-row fluorescent fixtures with louver diffusers to eliminate glare. The row spacing provides a generous light level throughout with negligible shadow and no glare.

The lobby of the building is impressive with a glass front from floor to ceiling. Tandem passage automatic electric-eye doors surrounded with "in" and "out" lanes make ingress and egress effortless as well as draftless. The lobby ceiling adds a note of glamour with a nascent glow of light through its very texture composed in its entirety of egg-cratelike louvers or—in the vernacular of the illuminating profession—a louverall ceiling.

The sidewalk in front of the entrance is provided with electric radiant heat for winter snow and ice removal. This novel feature is expected to reduce maintenance costs.

Auditorium

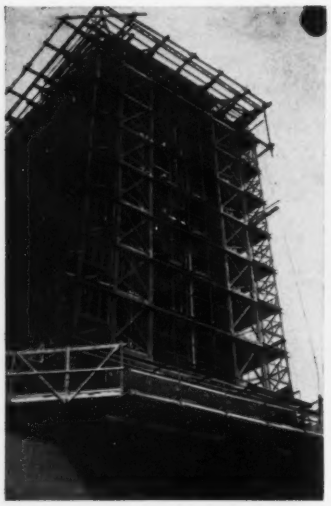
The building also features a spacious all-purpose room. Built in general like an auditorium except for the level floor, the room has a sawtooth-type ceiling which directs the light toward the front or stage area where a complete all-electric demonstration kitchen affords the ultra for the functions of the home economics department and assists in the lunchroom function which comprises the room's chief use. Special portable tables and handling trucks make possible the quick transformation from lunchroom to auditorium or even to ballroom. Adjacent checkroom and chair and equipment storage rooms enhance the utility of this multipurpose feature.

Floor Grid System

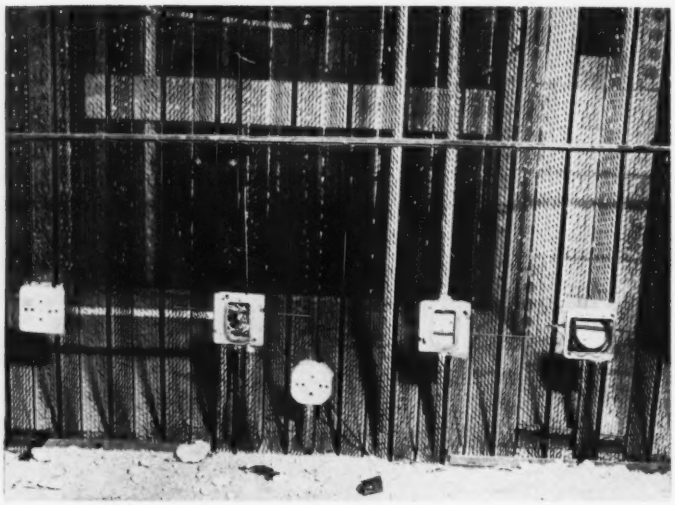
The electrical system also features a floor grid arrangement for power and communication. Convenience outlets, telephones or intercommunication equipment can be installed readily within a very short radius of any desired location. Clock outlets are provided in each room at the proper level and are all on a separate circuit assuring freedom from interruption other than a general power outage.

No description of this project would be complete without a brief description of the ultramodern drafting room on the building's second floor. Proportioned 48x60 ft, the room's 60-ft north exposure is virtually a glass wall. The base of these continuous windows is 42 in. above the floor and thus the sill is extended 30 in. into the room forming a shelf for reference drawings, books, calculators, etc., with room underneath for filing cabinets and the like. A row of drafting tables abut this ledge along their left-hand edge. From this ledge the windows extend upward approximtaely 10 ft and slope outward at a rakish angle. From the top of the windows the white ceiling slopes downward toward the center of the room reflecting the generous natural light downward. At the center of the room the ceiling height again rises to the same height as the windows, affording a large panel of glass blocks between the two levels. This portion of the ceiling also slopes downward toward the south wall.

With this design the natural light is at a very high illumination level even on cloudy days and there are virtually no shadows in the room. With this much glass area one might expect objectionable glare but the clear glass and the north exposure inhibit this discomfort. The three walls of the room are all tile in keeping with the general characteristics of the building. Cork tackboard panels feature the rear walls and a blackboard is provided in the front wall.



All conduit runs had to be made vertically and welded to the light steel frame for support. Some of the vertical runs in the outside walls can be faintly seen in the above



Thickness of inner plastered walls is the same as outlet box depth so metal lathe had to be cut away around back and front of each box. To hold box in place the contractor drilled the box and ran a short piece of iron rod through, which was clipped to the lathe. After the plaster had set the rod was cut off inside the box to insert fitting

Wiring a Building on the Vertical—

where no conduit can be run in the slab

What do you do when an architect designs a new-type building in which you can't run your conduit in the slab and there is no furring space? This confronted Maxwell Electric Co. of Spokane in the wiring of the new Ridpath Hotel being erected there on the site of a former hotel destroyed by fire. How the wiring is handled in this unique job is something new to contracting.

Architect Ned Abrams of Sunnyvale, Calif., is a modernist with new construction ideas. The 13-story hotel was designed without central supporting beams by making each floor a cantilever structure as part of a complete net of light steel members. The floor slab was designed thick enough only to support the weight of furniture and people on each floor. The walls were to be only 2-in. thick—a double plaster covering over metal lathe. Outside walls were windows at the corners and thin masonry walls hung on the frame.

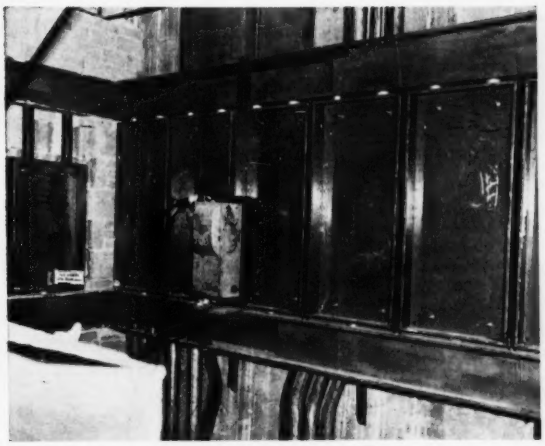
What this meant to the consulting engineers, Earl & Gropp of San Francisco, was the location of all pipe risers, both electric conduit and plumbing, vertically in these thin walls and not a pipe horizontally in the slabs. The only place horizontal space was available was in the basement ceilings and in furred space in the lobby areas.

It is one thing to design such a structure on paper but it is the contractor's problem to support his conduit runs in such a vertical arrangement, locate his boxes so accurately that they come within the 2-in. limits of the thin partitions barely thick enough to contain a shallow outlet box.

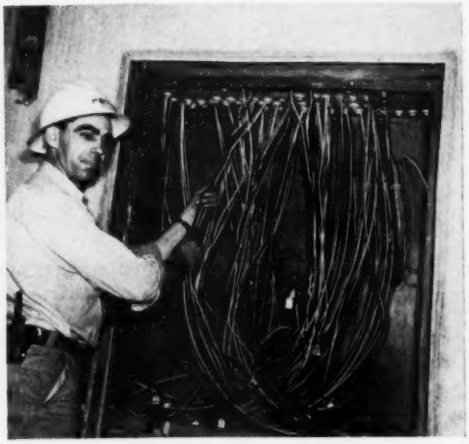
Each hotel room is served by five circuits, each of which go right straight up from floor to floor. Because boxes cannot be mounted back-to-back, a short horizontal tap is sometimes made from one box to one that opens in the next room wall. The halls are furred down from the slab and permit mounting of the cans for Prescolite flush ceiling lighting units. But lighting of the hotel room itself will be by portables, fed from wall outlets. Besides the convenience outlets each room has a radio and TV circuit connected to a master antenna system and an outlet for individual room air conditioner.

Conduit and electric metallic tubing was precut and bent in the basement shop of the contractor. As it was assembled, boxes, wherever possible, were welded to the steel framework for rigidity and to fix accurate placement respecting walls. In places where the runs came between walls where no steel framing went, boxes were welded to strips of steel that in turn were welded to the angle iron supports for the metal lathe. Boxes had to be within a ¼-in. tolerance. Pictures show a means used to fasten the box rigidly to the lathe before plastering.

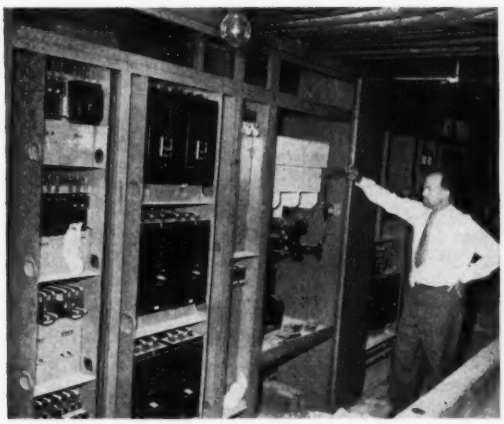
Deeper cans, such as to hold the individual bathroom electric heater or built-in lighted mirror, required a



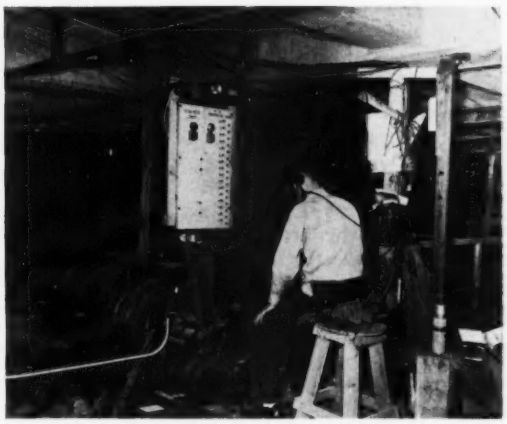
Six 42-circuit panels and wiring gutter in the centralized control room. (Temporary switch is only for construction power supply)



All vertical convenience and lighting outlet circuits made up in cables are pulled into this terminal-strip box, then to panels, left



Front of main switchboard in the subbasement, with Les Stewart of Maxwell's examining a relay. Transformer vault is at rear and on floor above, under sidewalk. Meters for submetering to store and garage tenants are on back of this board, a double-bused one



Although the construction hoist equipment is in the subbasement and its operator cannot see the hoist itself, he knows exactly where it is from this signal light and bell rig worked out in low voltage by Rex Kellom, Maxwell superintendent. Phones included

thicker wall but the plumbing was usually in such a wall and also required it. All plumbing was in soldered jointed copper tubing.

The hotel receives energy from Washington Water Power Co. from a vault in the sidewalk at basement level above the subbasement main switchboard. Power is taken at 2,300 volts from the underground loop, and transformed to 3-phase, 4-wire, 120/208, star. The main board has a 2,000-amp main breaker. It is double bused so that the stores and garage or any portion of the building can be separately metered. Meters and current transformers are in the back of the board. Fire alarm and exit lights are ahead of the main breaker. A temporary 800-amp service was used during construction for arc welding the building, frame, etc.

The lobby, restaurant and cocktail lounge on the main floor and mezzanine are air conditioned, with equipment located in a room back of the manager's office. Two 40-hp General Electric refrigeration units and blowers, etc., are located there. Also the main telephone pull box. The six circuit panels of 42 circuits each and a panel for the air conditioning and signs are all located at this level.

Circuit runs were assembled in cables and pulled from the top floor down, held in place at various levels to prevent running down the conduit from sheer weight. They terminate in a large box in a hall just above the panel room. Bob Hening, foreman for Maxwell's, is shown at this terminal box before strips were installed.

The top or 13th floor is to become the new quarters for the University Club and will be a totally glass enclosed sky room. Its lighting is being especially designed for it by Columbia Electric Mfg. Co. of Spokane. Completion is hoped for by the end of the year. It will bring Spokane another unusual hotel, but a modern one.

ELECTRICAL WEST

No Use Calling the Kettle Black

NORTHWEST aluminum producers have been asked to submit plans for moving a portion of their potlines to a region of assured power supply. A survey will probably show that the quickest way to sustain aluminum production is to bolster Northwest power supply. Several nonfederal agencies have been pleading with FPC for permits to develop sizable short-construction-time hydro projects. But FPC is holding up Tacoma's Cowlitz project and two projects of Portland General Electric Co. Why? It is the old fish and power controversy, and probably some politics, too.

It is a shame that this argument cannot be resolved. The problem *could* be solved if some interests were more conciliatory. Where there's a will, there's a way. The fish people, commercial and sportsmen alike, have been uncooperative in supplying some of the "will" and the "way." They have adamantly opposed practically all power dams on Northwest streams. There is some "dirty linen" and there are revealing facts that should be aired.

Defense mobilizer Wilson's action in the aluminum matter may start accusations flying again between private and public power. That would be a shame, too. In all fairness the blame for the power shortage cannot be hung on anyone or any interest in particular. Executives of all Northwest utilities—public and private—swung to full support of federal multipurpose dams in the spring of 1947. Since then they have appeared frequently with effective results before congressional committees in support of federal projects.

Has Interior been overselling its power supply to aluminum? That is debatable. A national emergency may call for "calculated risks."

The Northwest obviously needs more nonfederal projects right away, construction schedules stepped up if possible on the large federal propects, and possibly some steam plants, too. Nothing would be gained by renewing the private-public power feud. Relations are amicable and both are working in the public interest. There would be no fairness in the "pot calling the kettle black" over the present Northwest power shortage.

Water, Water—But Not Everywhere

EARLY last month all withdrawals of water from the Elephant Butte reservoir in New Mexico stopped. Storage was down to 17,000 acre-ft; the reservoir capacity is 2,127,000 acre-ft. Much of Texas lay parched and dry. In Oregon and Washington there had been no appreciable rain since March. Power rationing appeared a certainty because hydro plants lacked water. In other parts of the arid and semiarid Far West the situation was critical.

Water, the very lifeblood of this vast region, was again the foremost problem. Maldistribution of this previous asset once again was having a serious effect. New Mexicans glibly spoke of tapping the resources of the Columbia watershed. Arizonians accused Californians of raiding the Colorado. In Washington and Oregon people railed against a blue sky plan of the USBR to move Columbia River water into the Southwest through a program of river "displacement." And all of the states looked with suspicion on any federal program of river exploitation that might mean loss of water rights or loss of local control.

Some of these difficulties over water have stemmed from man's profligate use of the asset or his wastefulness; others from the vagaries of the weather. Mindful of Mark Twain's oft' quoted reference to the weather and man's reluctance to do anything about it, we cannot say the same about water. Much that has been done to use the West's water resources has lacked coordination or has been influenced by the exigencies of the moment. Hence the crises such as have developed this fall.

For the Far West as a whole there is a crying need for a unified and realistic look at the water problems of the entire area. Experience has proved also that this is not

EDITORIAL VIEWS

a task for the federal bureaucrats. The states themselves can and should undertake the job. The Western States Conference of Governors could well put this subject on the agenda for its next meeting with the idea of developing some kind of a cooperative water study. In the light of present conditions it should be apparent that the future welfare of the region is at stake.

Put Scrap Steel to Work

IF the projected rate of expansion of electrical facilities here in the West begins to falter and fall down, the reason will be because of a shortage of materials. The most critical item from a construction standpoint is steel. Without steel there can be no power houses nor any huge generators nor countless other machines required by the expansion program.

To insure the present high rate of steel production in the country it is necessary to use more scrap than in normal times. Word is that the steel race is being lost because of scrap. Mills are using the staggering amount of three million tons of scrap per month—50% more than at the peak of World War II. That isn't enough to keep pace with demand. And even worse, the supply is diminishing. So an appeal is going out from NPA for cooperation throughout all industry to increase the flow of heavy industrial scrap.

While utility systems do not make scrap in the sense that a steel-using industrial plant does, nevertheless there must be tons and tons of vital steel laying dormant in obsolete or unused machines and equipment around utility systems. Well-organized scrap drives would put this to use at a time when the need is vital. One industrial plant recently found 88 carloads of scrap laying around its plants. Another has 250 men assigned to collecting scrap which it sells for $1 million per year. Few utilities could do as well as either of these, but the opportunity to contribute something is there. A scrap drive now conceivably could save an equipment pinch later.

A Role for TV

ANYONE who witnessed the drama-packed telecasts of the Japanese peace treaty signing in San Francisco last month must have been impressed with the potential opportunity this great visual medium has for building understanding among the peoples of the world. The event initiated transcontinental telecasting in this country. Soon some similarly significant historical happening may initiate international telecasting.

What this might mean was succinctly summed up by David Davis, General Electric television sales manager, at the RMEL meeting at Santa Fe last month. He said: "The future role of television in international peace could be a vital one. For centuries it has been said that if the people of one country could see and talk to those of other countries, the Hitlers, the Mussolinis, the Stalins could never start wars. Perhaps with international TV, all the people on the earth will get well enough acquainted so that 'Peace on earth, goodwill toward men' can truly prevail."

Human understanding grows with the expansion of the channels of communication between people. If we could but penetrate the iron curtain with any or all of the present-day modern means of communication, the necessity for generations of a garrison economy in this country might disappear.

WHO are the forgotten people? The politicians are not specific, but we bankers know. They are the middle class, the people with savings accounts, the small investors of their savings, those with life insurance. But they have no pressure groups, no speeches are made for them, no banners, no implements to express their cause, they have no press, no publicity, no spokesmen, no defenders. They would have voting control if they were only organized.—Orval Adams, Utah First National Bank, to IEA conference.

Taken early on opening day crowds had not yet filled the auditorium and two side halls

All Want Another Wonderland

A measure of success is whether those who sponsor an event want to do so again. By this measure the second Electrical Wonderland show, which ran from Sept. 7 to 14 at San Francisco Civic Auditorium, sponsored by the Northern California Electrical Bureau, was a financial, artistic and commercial success. LeRoy H. Bennett, manager, felt so after making a critical analysis of the show after its run to 75,000 attendance. This was somewhat short of last year's 100,000 but the run was shorter, the weather was hot, the Japan Peace Treaty was on, and California's state fair ended on the Admission Day weekend.

Two surveys were made to determine the success of the show, with a view to determining whether to plan for another in 1952 and if so what changes might be made in its form or nature. Bennett made a survey of the exhibitors to learn their reactions, whether they felt they had got their money's worth from it and whether they were favorable to another next year. Of those who exhibited, 90% responded that they did want another show. Most of those felt they had received sufficient benefit or business to make it worthwhile. Some had suggestions or criticisms that will be taken into consideration next time.

Another survey of those attending the show was made on a spot check basis by the research department of Pacific Gas and Electric Co., one of the major sponsors. The group of interviewers sampled 133 visitors, men and women of all ages. Of these they found only 7.5% were connected with the electrical industry. All these people were asked: (1) Did you enjoy the show? (2) What features appealed to you most, or what didn't you like about it? (3) What form of advertising brought the show to your attention?

Replies indicated that 85% of the audience liked what they saw. Of these, 90% were men, 83% women. All said they would have liked to see more wonder in Wonderland, that is more scientific marvels and exhibits. The things that interested most were television, kitchens, freezers, the armed forces electrical equipment exhibited. There was some complaint that there was too much appliance and not enough science. Others felt there was not enough action, demonstration and spectacularly new things. Those exhibits in which there was more action, such as the electric garage door control; or newness, such as a new built-in electric oven and range top, drew most attention.

As to the form of advertising that attracted people to the show, most of those interviewed learned of the show from newspapers and radio announcements.

Dealers who participated with distributors in exhibits reported to Bennett that the show brought lots of prospects and many sales. One of the suggestions for next year is that it be held in Oakland, perhaps alternating each year between the two sides of the bay.

In his report to the directors of Northern California Electrical Bureau, Bennett makes some interesting observations and recommendations. One of the most damaging difficulties run into this year was a Musicians' Union quarrel with the radio and TV stations that prevented having any live radio or TV shows being broadcast from the stage of the auditorium. One show only, *Science in Action*, sponsored by a bank, was telecast from the show, but it involved no music.

Bennett feels that top-rank entertainment on the first and last day and perhaps on one day midweek should be scheduled. On the one day that this show had Dennis Day, there was the biggest attendance and the galleries was filled. Significantly that day the afternoon session was the lowest. Top entertainment also draws more publicity.

For afternoon sessions, he feels, more giveaways and gimmicks could be used to attract crowds.

The children this year had more to entertain them. They were permitted by the Air Force to sit in the two Link trainers and be swung around and the Army had a small tank in which they clamored and made the turret revolve and the guns move up and down. These were swarming with kids the entire time the show was open. As a result there was no rowdyism, and no injuries. Little literature was wastefully scattered about.

The General Motors scientific show in the Larkin Hall theater had a total attendance of 15,000. The Westinghouse science show had some 8,000. During the Japanese Peace Treaty debate and final signing the crowds around all the television sets were heavy. And upstairs on the balcony, where a small theater was set up with a large projection screen TV, there were crowds watching those proceedings. Mr. Gromyko obliged on Monday night with quite a debate.

The bureau reports that ticket sales went smoother. Only one woman asked for her money refunded. Police said she does it to all the shows.

Among the difficulties listed, in addition to the musicians' union fight,

San Francisco Electrical Contractors Assn. and Local No. 6 of International Brotherhood of Electrical Workers filled a portion of the Hall of Light with flowers as a garden or outdoor living room lighting exhibit. Bill Varley, manager, in foreground. Pacific Gas & Electric sponsored a history of light exhibit from San Francisco's famous museum. Crowds watched Gromyko at the Peace meeting on TV sets all over the hall, such as this one. There was a giant screen projection TV showing on the balcony in addition

Bennett said, that the feature attraction, the Loon, a guided missile, supplied by the Navy, and suspended over the center of the auditorium, presented some transportation and mounting problems and that the model planes which were to circle it could not do so. Hence this was not as effective as anticipated.

The dignified exhibit of field chaplain's equipment used at the war fronts drew sincere praise from those to whom such an exhibit meant much. This exhibit was well visited and armed forces chaplains were on hand constantly to talk to visitors about it.

It was felt that at the 1950 exposition the appliance displays were more adequately staffed. Some indeed were neglected this year and this even detracted from the show. The moving displays of last year were missed, such as the G-E talking and walking refrigerator, the Westinghouse robot man, the talking kitchens. With less action, it was felt that this brought the major criticism—that the show was not living up to its name of Wonderland. Yet the wonderland name is a valuable asset and perhaps a, decision should be made as to whether to have a straight merchandise show or to strive to get more of the spectacular scientific wonders to show. Consideration should be given also to later dates, when the show would not conflict with the state fair, it was suggested.

This show is an all-industry sponsored event, not one put on by an outside promoter. The expense of it was borne by the industry and the profit from it, derived from the nominal 50-cent admission charge, will go to support industry promotion events next year.

Meanwhile, Bennett announces that the model home program is going ahead despite materials restrictions that make it very difficult to build an adequately wired home. A model home is being built in Fresno by Harry Hunter, builder, to be open and on exhibit for 60 days. Hugh Codding in Santa Rosa has one under construction that will be exhibited 90 days. Thomas Yeadle is planning one in the East Bay. Fred Hignell Jr., contractor, in Chico has a tract of 35 to 40 homes, which will be all adequately wired and lighted.

● **Too late for this issue**—Full account of the annual fall conference of the Bureau of Home Appliances of San Diego County, held in still more condensed form than usual on the evening of Sept. 25, at Balboa Park, San Diego, will be made next issue.

Paul J. DeVine, W. H. Bintz Co., IEA president, and W. A. Huckins, UP&L sales manager, general conference chairman, at top. Lois Ferris, Westinghouse home economist, and Julia Kiene, home economics director, Mansfield, are next. Art L. Scaife, General Electric merchandise manager, Bridgeport, speaking; J. C. Littlefield, UP&L, afternoon chairman, seated. Three chapter presidents—E. A. Jensen, Preston; Nome Button, Richfield; and Bert K. Dart, Helper. Jensen and Dart were speakers. Bottom—J. L. Schricker, G-E Supply, IEA past president, with D. H. McAllister, recently appointed General Electric Co. manager for the Salt Lake City district

More Customer Follow-up

Answers to the theme question, "What to do in '52" came to the approximate 200 who attended the annual conference of Intermountain Electrical Assn. at the Newhouse, Salt Lake City, Sept. 21 through inspirational, policy and practical sales messages from a dozen local and national speakers.

What the IEA has done and is doing was told by Paul J. DeVine, IEA president and manager, W. H. Bintz Co. He reported membership increase of 30 firms to a total of 232. About 400 people in member firms are now protected under an insurance program IEA makes available, especially beneficial to small firms. Activities have been: a home freezer campaign with a freezer school at Granite High, attended by 2,700 on three nights, with 16 distributors and 40 dealers participating; the annual industry outing at Lagoon with largest attendance ever. IEA had served dealers by fighting provisions in an electrical ordinance that were prohibitive. He also cited work to get Regulation W relaxed and to protect dealers' interests in legislative matters. As for '52, he said, "It is up to you!"

"As Electricity Goes, So Goes the National Economy," George M. Gadsby, president both of Edison Electric Institute and of Utah Power & Light, proved with numerous examples. Of particular significance to selling, he said investor-owned utilities are in a quandry about what to do. DPA has frowned upon one company that has asked for materials and equipment to take care of increased load because that company is advertising and promoting sales of appliances. It leaves unanswered a vital question of whether the electric industry is in position to advocate the sale of equipment that uses large quantities of material and electricity. He then showed by both local and national examples how government control of electricity and labor would mean complete control of the nation.

Dealers need home service whether they recognize it or not, Julia Kiene, director, Westinghouse Home Economics Institute, Mansfield, told the group. And utility companies need home service girls to keep customers sold. There is a terrific reselling job to be done after every sale, she said. Many women have appliances bought for them, many are not accurately sold, many are oversold, sometimes features are not properly sold. If followed up by home service girls to do the final selling, as satisfied customers they bring in 40% of all prospects for more sales. And the utility gets the continuing benefit from long and ample appliance use. She discussed the training home service women should have. "Unfortunately they aren't all blonde, cute, curly headed, but they are professionally trained."

The whole science of selling is changing, Art L. Scaife, merchandise manager, General Electric Co., Bridgeport, told the audience after a luncheon served at the new Operations Center building of UP&L. With humor to accent his wisdom Scaife spoke of *Symbols,* and the need to look behind them to see what's there. Underneath all is change in methods. Only the human being does not change. He is ever a visual person, whose very thoughts are visual. Hence the perpetual need to illustrate and to demonstrate. Another fundamental is that it requires giving to get. "Any salesman who thinks of the commission he's going to make gets a mental attitude that makes him far less effective than when he is thinking of the service he is going to give."

Speaking of what's ahead, Scaife said he saw heavier restrictions, less production, less copper, chrome and nickel, shortages of everything of metal. Inventories are good, but that's like money in the bank. There will be price increases. The break-through of the wage ceiling in copper will start a break in all others. Selling will be under handicaps and affected by radical changes in distribution. He spoke of supermarkets as affecting drug chains, rack jobbers on lease deals with automatic merchandising racks. Advertising must change too. It must become believable and truthful, for the public is afraid of propaganda.

Drawn from its own membership and chapter officers were many speakers assigned specific topics.

"Display Your Merchandise," was the admonishment of Bert K. Dart, young president of the Southeastern Utah Chapter, salesman for Helper Furniture Co., in a well prepared talk. Among his views he advocated displays that tied in with customers interests—if in a farm community, use farm products as props; in an industrial area, tie the local industry to the wares displayed; in a city, to time saving. "Keep in mind your store is only

Advocated at IEA Meeting

one of many that will be visited before an important purchase is made," he reminded. (More complete text of his talk will be printed in a later issue.)

"Developing Prospects," was explained by Ernest Salerno, Consolidated Corp., Provo, president of Utah County Chapter, as meaning the nurturing of once-found prospects into a buying customer. He quoted many of the cleverly worded precepts of Elmer Wheeler, sales counsellor, as telling the means to do so. He urged that the first 10 words spoken to a prospect be made a benefit-promising message of greeting. Wheelerisms quoted were: "Don't sell the steak—sell the sizzle." "Don't write—telegraph." "Say it with flowers." "Don't ask 'if'—say 'which.'" "Watch your bark." "Don't do all the talking." "Develop your *you*-ability." He also stressed the importance of the service department in developing prospects. There is no need for discounts if one has really sold a customer.

"Customers as they are," were described by Olin H. Ririe, Ogden division manager, UP&L. He described the company's customer service plan's operation; how well-trained people call on all customers to explain electrical uses and costs, etc. Among many complaints found is the one that appliances once sold have not been sufficiently explained and demonstrated. Ririe advocated that dealers or some trained employee during slack times should make telephone calls to all customers or write them cards or letters and clear up any cause of dissatisfaction. "This business of yours is not the kind for a quick dollar. It is a long-time business," said Ririe. Such calls could be made at no cost increase but would do good to the entire industry for years. "When a customer is lost, we can even lose our good name."

"Advertising," was the topic of Collin Lowder, manager of station KLO, Ogden. Quoting scripture as expressing a fundamental, "If any one of you would be great among you, let him be the servant of all," he urged that advertising express service. He spoke in general terms of advertising, public relations, use of various media and the paramount need for truth in advertising.

"Establish customer confidence through principles of sales training," was E. A. Jensen's subject. He is president of Cache Valley Chapter, owner of a Western-Gamble store in Logan. His was largely an inspirational appeal to know one's products, build confidence in them and the store, never argue with customers, never let the business down by breaking faith with customers.

"Farm Markets," their peculiarities and the opportunities for sales to these markets were ably handled by S. Reed Nixon, Telluride Power Co., Richfield, in a talk that will also be run in more detail in a later issue. He spoke of discoveries during farm calls: woefully inadequate and even unsafe wiring, incapable of serving the electric equipment farmers had been sold; dealers not informed enough to advise properly.

Tom Purton, UP&L engineer, explained features of the new Operations Center building (see p. 84) in which the afternoon session was held prior to tours around the building and the new Gadsby steam plant.

Ernest Dee, retiring G-E Lamp manager, and E. E. Brazier, retired G-E Supply manager, were presented honorary life memberships in IEA at the banquet that night by President DeVine. John Longden, Westinghouse Electric Supply Co. manager, presided and Orval Adams, executive vice-president, Utah First National Bank, made the address on "Your Money and Your Freedom." In it he advocated that savings depositors and insurance policyholders organize themselves into a pressure group to protect their money from inflationary trends lest it become worthless and the nation drift from chaos to dictatorship as a receiver. No solvent country has ever gone for a dictatorship, he said. But the formula for it always has been bankruptcy to chaos to dictatorship.

Chairmen for the morning and afternoon sessions, respectively, were Kenneth E. Smith, president of the Salt Lake retail division, and J. C. Littlefield, manager, Salt Lake division, UP&L. W. A. Huckins, UP&L sales manager, headed the general conference committee; R. S. Belnap, General Electric Supply Co., banquet; John Longden, Westinghouse Electric Supply, ladies entertainment; W. A. Huckins, program; Lon Richardson, publicity and Ray Halverson, attendance. An exceptionally large number of wives attended and were entertained at the country club with a flower arrangement program.

The IEA conference in previous years has been a two-day meeting.

George M. Gadsby, president of EEI and UP&L speaking. Beside him are Paul DeVine and Ernest Salerno, president, Utah County Chapter, a later speaker. Below them, S. Reed Nixon of Telluride Power Co., Richfield, speaking of farm market opportunity. Olin H. Ririe, Ogden division manager, UP&L, a morning session speaker, with Hack Miller, Frigidaire manager of W. H. Bintz Co., "friendship hour" committee chairman. Tall Ray Halverson, IEA managing director, and Ken Smith, morning session chairman. Bottom —Ernest Dee and Ernest E. Brazier receive honorary life membership cards from President Paul DeVine on behalf of IEA

Round Table Girls' Institute

It was the Electrical Women's Round Table in Seattle that staged the Electric Appliance Institute last fall in that city, and it plans to do so again this fall. ELECTRICAL WEST erroneously attributed it in a previous report to a single organization but really it was the work of the entire group of women in the electrical industry there.

The Electrical Women's Round Table was organized about four years ago by Edith Rauch, director of home service, Puget Sound Power & Light Co., at the suggestion of Frances Armin of the National Electrical Manufacturers Assn., New York. On a visit to the Coast, Miss Armin advised the getting of a group of women in the industry together and to try meeting regularly for awhile to determine whether a Round Table could be formed. A very successful one has existed in New York for several years.

At the first meeting 25 women attended. The purpose was explained to them. It is to promote better acceptance of electricity for all home uses.

For two years the group met monthly and then set up permanent organization. It now meets the first Monday each month at the Elks Club for a luncheon. Average attendance has been 24, often running to 40. The group welcomes anyone interested in electric equipment—newspaper women, radio home service commentators and economists, dealers' demonstrators, women working for distributors, dealers' sales women.

At each meeting a speaker is obtained to talk on some subject pertaining to the industry. There have been talks on all the appliances, on adequate wiring, on codes, on plumbing requirements for appliances, on kitchen planning. When Myrtle Fahsbender was in Seattle she addressed the group on home lighting.

Last September Miss Edna Martin, superintendent of home economics for Seattle schools, asked for an appliance institute. She wished it to be open to other neighboring counties. So the Round Table girls organized it with the help of the home economists for the several manufacturers of appliances. The course of six weeks was extended a seventh week because of the interest shown. Attendance was 75.

The course was directed to teachers, who were given one professional credit for attending. Participants last year were: Edith Rauch, chairman, Edna Martin and Agnes Reinertsen of Seattle public schools, coordinators; instructors — Bruce Duncan, Sunset Electric Co.; Velma Seat, Sunset Electric Co.; Wilma Sledge, Commercial Appliance; Louise Fletcher, same; Marguerite Rinehart, Hotpoint; Carolyn Byron, Harper Meggee; Evelyn Grewe, F. B. Connolley; Margaret Hyland, General Electric; Howard Oliphant and Marjorie Harper, same; Jerrie McCarrie, same; Dorothy Sherrill, Graybar; Christine Dent, Westinghouse; Irene Hanson, Wesco; G. B. Buck II, General Electric Lamp Dept.

Plans were being formulated this summer for a second institute this fall. The Round Table is now headed by Dorothy Sherrill, Graybar, as chairman; Alice Hazeltine, General Electric Supply, treasurer; Coral Kay Beckman, Seattle City Light, secretary; and Helen Steiner, extension service, Department of Agriculture, program chairman. Ann Ogden, Portland General Electric Co. home economist, has visited and is endeavoring to form a chapter of the Round Table in Portland.

An automatic clothes dryer campaign closed after a successful run in San Diego County during September. Over 100 dealers participated, each having dryers for demonstration and using material supplied by the Bureau of Home Appliances. The formula was one used in the ironer campaign —that to qualify for a chance at one of the six dryers, a person had to come to a dealer's store and have one thoroughly demonstrated to her. The prize winners would then be given a dryer chosen by lot from among the nine cooperating makes—Apex, Bendix, Blackstone, Frigidaire, Hamilton, Hotpoint, Kenmore, Temco and Westinghouse. The contest was supported by a strong advertising program by newspaper and radio.

Herbert Bell, founder and president of Packard-Bell radio and television, is congratulated by Art Baker, TV star, at Silver Anniversary dinner tendered Bell at which 80 officials and distributors in the 11 Western states paid him tribute

Cookbook for Today's Prices

Practical help in serving tasty, nourishing meals at today's food prices is given in *Better Meals at Lower Cost*, prepared by the Pacific Gas and Electric Co. home economics department, under supervision of its director, Marguerite Fenner.

The 80-page, 8½x11 paper-bound book contains latest information on nutrition, presented in simple language, and accompanied by home-tested recipes, menus and ideas for meal planning.

At a luncheon introducing it to food editors and commentators, O. R. Doerr, PG and E vice-president in charge of sales, J. S. C. Ross, manager of domestic sales, and Miss Fenner called for ideas for widest possible distribution. The company is giving free copies to women who attend either the six-session course on nutrition or single nutrition lectures given by PG and E home economists and is making provision for organizations such as the Red Cross to secure copies at printing cost. To make it available to the general public, the book is being sold at $1 a copy through the Northern California Electrical Bureau and the Gas Appliance Society, both 1355 Market St., San Francisco.

End Free Installation

Because of probable cutbacks in electric power loads this winter, Tacoma City Light has terminated a program under which it installed electric water heaters free in certain instances. During the nine months the program lasted, 1,700 electric side arm heaters were replaced with automatic heaters, according to Superintendent J. Frank Ward. This reduced the peak hour system load by 3,400 kw and resulted in sales to dealers and others amounting to $238,000, plus $85,000 in labor and materials, he said.

ELECTRICAL WEST Contractors' News Letter

QUICK NEWS ON TRENDS, LAWS, CODES, MATERIALS, EQUIPMENT, COSTS, WAGES, ETC.

Still fighting

Construction, a strong and vigorous industry, is dying hard. Even hardest hit home building is carrying on, a lot of it not at high union scales though. Approvals from NPA to start building have been very tough to get, but a few seem to be wangled through the red tape. Some of the exempt jobs are plodding along, searching for materials, waiting for labor. Not easy to keep overhead down at such a pace, with OPS sitting on the lid.

Life blood

Copper is really in a bind. Business Week reports less American production, the strikes, and less import, with military demand just beginning, are fast making it as rare as gold. Aluminum hasn't yet replaced it enough as wire, but is bound to. NPA is asking all government agencies to design with no more than the National Electrical Code (usually a minimum and not meant for efficient operation) as a maximum.

Change the rules

New regulations went into effect Oct. 1 with CMP reg. 6, and M-4A amended to put the new limits on copper (wire) and steel (conduit). It seems to be permissible to use more material than the pound limit on residences but no more than the poundage will be allowed replaced. It reduces your inventory. It is well to watch the delivery date in using the U-6, U-7 or U-8 self-authorization symbols. They are not to be used in replacing inventory, only for specific jobs. The MRO allotments are under CMP-5. These apparently are not under quarterly designation. Only trouble is that the steel and copper allocations for all industry add up to more than the supply. There's also a new super-priority rating, a DX.

No fix yet

Price control in the contracting business is still undecided as this went to press. There have been busy committee meetings in Washington trying to formulate it. First drafts were unrealistically complicated. Late reports showed promise of a simple order, without a lot of reporting but asking that records be kept handy in case of complaints or investigation. Up to the time it comes out contractors are under another regulation, No. 67, which blankets all electrical materials except appliances or portable lamps but does include fixtures. It sets the markup base as the one followed between April 1 and June 24, 1950.

And demand it

Dan Tracy, IBEW president, addressed San Francisco Electric Club, Sept. 24, while he and Scott Milne and others were in that city during the AF of L convention. He declared strongly for free enterprise as necessary for free labor; said the AF of L unions were getting the communists out of their ranks; made no bones about new demands being planned, saying that they watch business closely and know what the traffic will bear.

Engineer design

Robert Thallon will now head a department of design engineering for Fluorescent Fixtures of California, San Francisco, makers of All-Brite, according to Charles Buchanan, vice-president. Graduate of Stanford, he has been on the illuminating engineering staff of PG and E in Oakland.

How snafu can it get?

Negotiations for wage increases in the Idaho Falls area are becoming more complicated. Scale is $2.15, and there is practically no civilian work but local 1541 turned down a 10c-an-hour raise. The freeze came along; it would hold them to $2.20, which the union won't accept. Change of the base period to June 1950 would allow a raise to $2.36½. Meanwhile the business manager skipped with funds and local 1541 was taken over by local 449 in Pocatello, whose scale is $2.36½. Then to make things even more so, WSB approved a rate of $2.75 and $21 a week subsistence for the Arco Atomic Energy Project. They are still negotiating—

Fringe ethics

And Oakland's local 595 now says its 4% for vacation isn't wages but a fringe so has to ask for the full 10% increase—plus the vacation 4%. This is what comes of learning to read words with double meanings. All electrical unions are looking for fringes or wording loopholes or for a new break in the WSB ceiling to put in for raises in January.

Try it, buy it

Electrical inspectors are being offered a free trial of the Amprobe snap-around volt-ammeter by its maker, Pyramid Instrument Corp. In answer to a postcard the distributor will deliver one to the inspector to try out on his rounds and ten days later will call back to pick it up or sell it.

Electric —safe

Portable signal flashers are replacing the fire-dangerous and smoky kerosene lantern or bomb used to warn traffic of road work, etc. Haledy Electronics Co. announces a new low-cost flasher of cold-cathode tube design using three 90-volt batteries in series. Calls it "Blinky."

Winders

Tri-State Supply Corp. has been appointed factory rep for California, Arizona and Nevada for Potter & Rayfield Inc. of Atlanta, makers of Browning coil winding equipment, used by motor shops and maintenance departments.

Well Started

A. L. Stone, one of the founders of Los Angeles Construction Industries Exposition and Home Show and its treasurer through its six years of existence, has retired from the board of directors. He is succeeded by Donald E. Reed. J. A. Powers, long a director, was recently named president.

Which Wire table?

Difficulties arising out of the Electrical Safety Orders of California wire tables, held over from the 1934 edition, in conflict with the National Electrical Code wire tables, are to be adjusted in some special hearings to be called soon. While the ESO tables have not proved unsafe, the chief concern of the Division of Industrial Safety, when wires are under constant load the heat generated destroys the insulation. Another problem is that the ESO are retroactive, and if enforced would require rewiring of most existing installations with larger wires, a practical impossibility, especially under copper restrictions and shortages.

Confused too

Some errors were made in our analysis of the differences between the Code and Safety Orders, (see August issue, p. 83-4) and corrections will be made in our November issue. Some additional details may also be included. Our sharp-eyed readers lets us know when we make a mistake, for which we thank them and invite it always. Our aim is to be accurate.

Find it in the dark

A lighted pushbutton, containing the name of the home owner, is a new gimmick being produced by NuTone Inc., makers of chimes. Inside a weatherproof Lucite case a tiny lamp lights up the name and outlines the pushbutton. Comes packaged and lists for $2.50.

Practical course

Electrical Construction Practices is the name given to a University of California extension course being conducted by Scott Beamer, electrical engineer of Oakland. It is being given at the Powell St. UC building in San Francisco on Thursday nights. Dan Finch and Joe Gier are conducting a course in illuminating engineering at the Berkeley campus on Tuesdays.

New things

Interesting new devices include: A new Pryne ceiling fan designed for installation in restricted soffit ceiling areas, that can discharge either at the top or sides. • A Koroseal electrical tape, by Goodrich, that will not transfer or lose its stickiness to other surfaces, has high dielectric, water, alkali and oil resisting qualities. • A magnet in a brass case by which National Electric Products helps you locate steel underfloor raceways. • A new Holophane Controlens with a concave cross-section for directing light at vertical surfaces, such as chalkboards, etc.

Sockets too

Royal Electric Co. of Pawtucket has acquired the Nu-Way Electric Mfg. Co., a maker of sockets. So now Royal's line of insulated wire, cord sets, fuses, Christmas lighting and wiring devices will be augmented with a full line of UL listed sockets of pull-chain, turnknob and keyless types.

Up-to-date

A New IES Lighting Handbook is about to be distributed as it comes off the presses, a complete revision of the first edition with much added new data developed in the four years since the first one. It is offered to members at $4.50, costs others $8.

Help needed

The Home Lighting Group of PCEA is requesting the lamp makers—G-E, Sylvania and Westinghouse—to emphasize the importance of modernizing the lighting in existing homes in their radio, TV and magazine advertising.

Silence speaks

Acoustics has a language of its own, and now American Standards Assn. has issued a booklet on terminology to assist designers working in that field.

ELECTRICAL WEST Sales Guide

News Letter

FOR THE ELECTRICAL MERCHANT OF THE WEST

October 1951 ©

The long wished for upturn in appliance business hasn't been all good, especially in TV areas. For dropping of prices by manufacturers and dumping of surplus inventory in price-cutting deals, without protection to dealers, has brought profitless, sometimes even costly, volume. In the Salt Lake City area dealers refused to spend any more of their money in a promotion campaign on TV to bring sales on which there was no profit. The Japan peace conference and the World Series baseball games on the relay network pepped up sales without any special effort.

A wormy turn

Efforts to get Congress to go easy on excise taxes on appliances as a source of revenue and to look to digging some equality of taxes out of cooperatives and mutuals instead, have brought some results, even if not all wished for. The American Home Laundry Mfg. Assn. ran full page ads in the Washington Post addressed to senators. "It's not right, Senator," it told them, to cause an added $25 to $35 to the price of a washer with excise tax that will deprive those most needing washers from having one. At last report the tax on cooperatives was in and out of the tax bill a few times, and back in, somewhat watered down.

Shifting taxes

Fair Trade isn't being violated as much as it was. The cure to the effect of the Supreme Court ruling, American Fair Trade Council feels, is a clear amendment to the Miller-Tydings Act. It has started a drive to interest congressmen and senators to do that with the assistance of the home town dealers whose businesses are sufferers from loss leaders.

Change needed

An unbeknownst survey of customers, followed by a shopping survey of stores in Salt Lake City revealed some pretty sad lacks in salesmanship in an excellent market. Only one in ten customers had ever been followed up after the sale to make sure of satisfaction. Over half the salesmen contacted failed to acknowledge the shopper's presence in the store, 79% failed to get the name and address, 90% never asked to make a home call. (See story next issue for details.)

Not unique

Sam Vining, most colorful sales trouper and actor-speaker, gave his last two highly humorous and sales wise talks to the dealers of San Diego and Los Angeles. Just as he was about to address those of Bakersfield, Friday night, Sept. 28, he suffered a stroke from which on Saturday morning, Sept. 29, he died. He was on his way to Vancouver where dealers expected to hear him give some of his famous "sales slants." The appliance industry has lost one of its most fascinating characters. His last messages and the last pictures taken of him will appear next issue—the way he would like to be remembered.

Farewell to a trouper

TV net works

TV is serving one of its best purposes these days as it links the entire nation by networks to bring such events as the peace conference and the World Series games. . Color, in the background during this time, is struggling to emerge. CBS is colorwheel-casting the Series over a limited net in New York area, planting 10 sets in a city, inviting 50 people to view each, hoping to create an appetite for it. . Field tests of RCA's compatible color were made over both co-ax and relay from NY to Washington with excellent results; could do so to SF and LA and SLC and viewers could see in b&w. . Paramount Pictures has announced a new tube to receive both systems and b&w, invented by Prof. E. O. Lawrence of UC's atomic fame. It will be produced by Chromic TV Labs, a subsidiary of Paramount. . Bell Telephone Labs are developing a new tube to increase the number of TV and telephone channels at one time over the new relay network; Varian Associates of San Carlos spoke of a Klystron for G-E to do such work, at the IRE convention in SF.

Sales squirm

Saleswise TV has picked up tremendously but dealers aren't happy about it. Discount selling, dumping by manufacturers, price cuts without any dealer protection, centralizing service and taking some of the margin off to pay for it, all have made TV volume profitless. Some stores have reduced TV departments to a minimum. . In San Francisco the District Attorney and Better Business Bureau started a drive to prosecute a half dozen dealers accused of misleading advertising and false sales promises. The News is championing the cleanup campaign.

Highest station

Salt Lake City's station KSL-TV will be relocated on a 9,000 ft peak in the range West of that city, above the Garfield smelter from which it claims its signal will reach 80% of all Utah. . In Denver, a city without a TV station, Mel Collier, music dealer, installed a high antenna and a Scott long range TV chassis and brought in pictures from Detroit, Miami, San Francisco and Los Angeles.

New models, prices

Founder-president Herbert A. Bell, of Packard-Bell, Los Angeles, was honored for 25 years in the radio industry by company officials and distributors from 11 Western states. Price increases this fall were predicted by Bell as costs increase. A new 24-in. tube model was shown in previews. . Motorola's president Paul Galvin came West too, with price drops but predictions they may go higher after December. . Kaye-Halbert has changed its distribution and service setup, taking over its own distribution and is testing in Los Angeles a central service station plan that may be extended to other areas. A second year parts and service warranty for around $20 is part of the plan. . Emerson Radio told its distributor convention its leader would be priced $279.95 for a 20-in. console, a 17-in. table model at $199.95. . Walt Stickel, ex-Westerner now DuMont sales manager, brought distributor meetings in the West news of new models and new developments such as a color adapter, an UHF converter, a DuMatic switch for shifting gears to the CBS 405-line and back to 525. Also told of picture tube replacement sales possibilities and offered a pocket tube selector guide; awarded B. K. Sweeney Co. of Denver a scroll for sales effort. . Webster-Chicago Corp. announced an auxilliary color unit for attachment to standard receivers; was the one which made CBS' originally. . And Celomat Corp. of New York is in production of dual color wheels.

And news

California's state law prohibiting TV in any motor vehicle, which is located in view of the driver, has gone into effect. . Color Television Inc. of San Francisco has taken on airborne radar equipment manufacture in addition to its color TV research. . Rider Publishing Co. has a book, "Television and Electronics as a Career." . NARDA is advocating a "buddy system" among its members for training.

Names in the news

Bob Burrows, former National Lamp division of G-E manager in San Francisco, lately assistant ad manager in Cleveland, is retiring to southern California after 36 years with G-E Lamp. . Al Meyer, president of Leo J. Meyberg Co. has made some important changes. Paul R. Buehler, for 7 years sales manager, Los Angeles branch, comes to San Francisco as vice-president and general manager. Louis A. Haugh takes Buehler's place in Los Angeles as assistant to general manager L. E. Starkweather. He had been advertising and sales promotion manager. George W. Oliver, former promotion man for Packard-Bell, steps into the Meyberg post. . Marshall C. Wells, former general sales manager at Sues, Young & Brown has been made sales promotion manager of Hoffman Sales Corp., distributor for Hoffman Radio. James R. Hill, service manager for Herbert H. Horn Co. becomes service manager for Hoffman Radio. . B. B. Pierce Jr. has become special representative for Bendix Home Appliance division of Avco in the Northwest. He was for some years president of Distributors Inc. of Seattle. . Tommy Crosson, spectacular operator of Platt Radio stores in Los Angeles opened a sixth store at Broadway and 9th and will have another in the San Fernando valley. . Howard Oliphant, for a year manager of G-E appliance sales for Seattle area, formerly in San Francisco, has been named sales manager of electric ranges at G-E Bridgeport. . Ed Morgan was named general sales manager of Kierulff & Co., Los Angeles, recently, a former Motorola man. . Ted Wyatt, resident RCA manager in San Diego, has been made field sales manager, RCA division, for Meyberg, Los Angeles, and Burt Jones takes his place. . L. P. Dobner, former assistant regional manager, Portland, of Maytag Northwest Co., is now regional branch manager in Salt Lake City. . George Hondlik has joined Clyde Allen Co., San Francisco Mart, to handle B&R Electronics Co., Fresh'nd-Aire, TV furniture division of Gravely. He comes from Minneapolis. . A. O. Grotenhuis, former sales promotion manager, Moe Light Inc., becomes district manager for California, Utah, Nevada and Arizona. Harold Pressnall has resigned from Dalco to join John Gregory, another former Dalco man, as representatives of John Meck Industries for northern California. They have offices in the Paul Rice space, 458, at San Francisco Mart. . Fred L. Barber, former Frank Edwards sales manager, is now the same for Pacific Telecoin Corp. in SF. . Mel E. Maurer, previously assistant works manager for Lockheed Aircraft at Burbank, has been made vice-president of manufacturing for Nesco Inc. He also had been with Hotpoint. . Robert H. Thomson Jr. has been made director of ads and sales promotion for Packard-Bell.

Show times

Dates for the winter shows announced so far: Home Furnishings Market, Chicago, Jan. 7-18. Los Angeles Market, Jan. 28-Feb. 1. San Francisco Western Market, Feb. 4-8; Housewares shows—San Francisco Feb. 3-6, Seattle Feb. 17-21, Portland Feb. 24-27.

Go West

Gibson Refrigerator Co., celebrating its 75th anniversary, will stage distributor meetings across country; that for the West at Las Vegas, Nev., Oct. 29-30. J. L. Johnson, sales v-p; F. S. Gibson Jr. and others of the company executive will attend and speak.

Wet or dry

Sunbeam introduced a new combination steam or dry iron, weighing only 2 2/3 lb, in which the user plugs in a water tube alongside the cord, and which sells for $21.90, at a series of distributor and dealer meetings in the West.

Table roto

An infrared rotisserie and broiler combination for table use, with a concealed motor to turn the spit, is being made by Broil-Quik Co. to retail at $54.95. Protection against splatter, even heat distribution are attained, with six levels of adjustment.

A new type food mixer, usable either portably or fixed, has been announced by the Manning Bowman Co. division of McGraw Electric. It has its own bowl, weighs under 5 lb, has a powerful motor. . McGraw Electric recently consolidated sales representation of its Toastmaster, Manning Bowman and Everhot products; and Ken E. Campbell, Los Angeles, regional manager, has the following representatives: W. H. Smith, Box 202C, Danville (near Oakland); B. S. Green, 316 E. 3rd St., Los Angeles; W. P. Moore, 6026 44th Ave., Seattle; and R. W. Mohr, 2341 Olive, Denver.

New mixer

The $100 trade in on old sinks offered by Gough Industries Inc. and Youngstown Kitchens has boomed sales of Jet Tower dishwashers. The dealer can offer the waste disposer in lieu of the allowance. . Gough Industries, by the way, opened a new branch in San Bernardino on Highway 99, on the road to Colton, where 70,000 sq ft of floor space and parking, with a showroom and meeting room, are now in use.

Sinks sunk

Servel, according to Business Week, is making a desperate effort to turn bad publicity from unvented gas deaths, for which it has received a black eye, by offering to replace at wholesale cost any gas refrigerator over 10 years old. Manufacturer, distributor and dealer share in the discount.

Suffocated sales

Lightolier has brought out a new and highly attractive modern styling in torchiers. Called DaRays, they are a highly efficient floor lighting device as well as having clean modern lines. It has also introduced several new and larger Decoralite picture-lamps, 25x30-in. for use in living rooms with large wall areas. Three new styles have been added also to the standard size. Altogether there are 20 styles in the line.

It can be done

A West Coast meeting of the National Appliance Service Assn. is to meet in the plant of California Electric Service Stations in San Francisco, Oct. 12, at which Keith Chamblin, president of the association, will be host. Service station operators from Washington, Oregon and California were expected to be present to discuss new problems.

Fixers meet

Its fall conference a big success, Sept. 25, (see next issue for story) the Bureau of Home Appliances of San Diego, the next big event is the 14th annual electric and home appliance show, Nov. 23-28, for which Clark Chamberlain, manager, says space is being signed for but fast. While East to attend the IAELeagues conference he plans to visit many factories to bring back late news of products, plans and potentials.

Big show

The 1952 campaign plans for the electric housewares section of NEMA have been approved and the slogan, "Give electric housewares--first choice for every gift occasion," will be implemented with plenty of advertising and promotion plans.

Won't forget

Sacramento Valley Electric League is offering to its people a business relations conference program run by J. Wm. Olgardt, of Results Unlimited, sales counsellor, a series of six 2½-hour courses under a group rate plan, dividing the cost among the participants.

School time

After hearing from Otto Brandt, manager of KING-TV, Seattle, the Seattle Appliance & Music Assn. plans to follow with a talk by Phil Hamlin this month, on TV to depressed areas.

TV talks

Southern California Edison Co. is featuring light conditioning for homes in its October advertising and promotion, for which dealers are equipped with a sales helper, "Here's the Key to More Lighting Sales."

To sell light

NORTHWEST ELECTRIC LIGHT AND POWER ASSOCIATION

Utilization Data Sheet No. 86

SUBJECT: Battery-powered Milk Delivery Truck
CUSTOMER: Jersey Farms Ltd., Vancouver, B. C.
TYPE OF BUSINESS: Milk Processing Plant
SERVICE COMPANY B. C. Electric Co. Ltd.
DATA SHEET PREPARED BY: F. Nosworthy, Assistant Power Sales Engineer

Jersey Farms Ltd., one of Vancouver's largest dairies, has a battery-powered electric truck making regular deliveries on an 18-mile retail milk route. The truck, which has a carrying capacity of 3,500 lb, has a 72-v, 258 amp-hr battery that drives a 12-hp motor. Working range is 25 to 35 miles, depending on load and number of stops, with a maximum speed of 20 miles per hour.

The truck was imported from England on a trial basis in an effort to reduce delivery costs that have been skyrocketing for both the gas trucks and horse-drawn wagons operated by the dairy. In seven months of operation the truck has proved suitable for local conditions, and has shown that it could deliver milk considerably cheaper than either the gas trucks or horse-drawn wagons. It operated during last winter's snow and ice conditions without any difficulty, outperforming gas trucks on the slippery hills.

Jersey Farms Ltd. was so pleased with the performance of the truck that it ordered two more and later three more. Mr. Carlyle, manager, states that "operating and maintenance costs of the electric truck are at least 33% less than either gas trucks or horse-drawn vehicles. Our drivers like the quick getaway, quietness and ease of operation. We plan on ultimately replacing our entire fleet of 16 horse-drawn vehicles with electric trucks."

In about eight months the truck has gone 3,500 miles, which required 4,900 kwh for battery charging or 1.4 kwh per mile of travel. As the charging is done at night when the milk processing plant is down, the charger does not increase the demand, and energy is supplied at the incremental rate of 0.5c per kwh. This gives a fuel cost of 0.7c per mile.

Smiths Electric Vehicles Ltd. of England supplied the truck, which is obtainable in the conventional or stand-drive models. Price of either model, including battery and charger, is considerably more than a conventional gas truck (slightly more than a stand-drive gas truck). However, the increased initial cost is more than offset by the operating economy, negligible maintenance and longer life.

The battery is an Exide and is guaranteed for four years.

This is the first known use of an electric truck on a milk delivery route in Canada. The very satisfactory results show a potential market of interest to utilities.

Before the truck was put in service it was tested on the steepest hills in the city and also in North Vancouver, and it climbed them all (fully loaded) without any difficulty. The manufacturer states that a loaded truck will climb a 25% grade for one minute or a 10% grade for eight minutes before the overload relays will operate. Jersey Farms has experienced no difficulty negotiating the hills on any of its routes. The truck does not use regenerative braking. Brakes are Lockheed hydraulic and drums are 12 in. in diameter by 1¾ in. wide.

Truck Details

Weights: payload .....3,500 lb
battery .....2,000 lb
truck empty .....4,400 lb
(including batteries)

Performance and Consumption

Maximum speed: 20 miles per hr
Range on one battery charge: 25-35 miles depending on load and stops
Energy consumption: 28 kwh (full charge)
Charging time: 6-9 hr

Electric milk truck replaces one horse shay

Comparative Operating Costs

Comparative operating costs of gas trucks are presented here with the caution that the reader take into consideration the following:

1. Limited experience with the electric truck.
2. Difference of operating costs here and in the U.S.A.
3. The limited range of the electric truck makes a direct comparison of operating and maintentance costs unfair to the gas truck.

However, a check of actual operating costs of a gas truck is of interest for it reveals the tremendous cost of retail milk delivery and also makes the electric truck look just that much better.

The following figures were obtained from two of Vancouver's largest dairies:

1. Price of gasoline, 29c per U. S. gallon. Mileage, six miles per gallon.
2. Price of oil, 32c per U. S. quart. Oil consumption, 125 miles per quart (this includes changes).
3. Repair and maintenance costs are difficult to assess accurately because of the methods used; however, a fair average would be between 4c and 5c per mile. This figure covers all costs except depreciation. One dairy states that total operating and maintenance costs of their retail one-ton gas trucks, including depreciation, average slightly more than 15c per mile.

Loiseau Gadsby

Prager Gros

Davis Heffelman

RMEL Speakers Stress American Principles

Critical times such as the present bring complex physical problems to a dynamic business like the electrical industry as evidenced by materials and manpower, but these should not obscure or defer long-range intangible objectives like building a favorable public opinion or developing a favorable economic and political climate to insure preservation of the American principles of dignity and freedom. Speaker after speaker emphasized these points to the 350 people attending the annual meeting of the Rocky Mountain Electrical League at Santa Fe, N. M., Sept. 10-12. The well-rounded program left no doubt in the minds of those comprising a record attendance at any RMEL meeting that the electrical industry, although handicapped by the complexities of operating in a garrison economy, is making progress on all fronts.

Importance of an adequate plan for shaping public opinion from the grass roots to the national level was emphasized by such industry leaders as George M. Gadsby, president of Utah Power & Light Co. and president of EEI; John E. Loiseau, president, Public Service Co. of Colorado; and Edward Vennard, vice-president, Middle West Service Co., Chicago. Citing the progress the industry has made in winning public support as evidenced by national surveys, EEI President Gadsby made a strong plea for industry unity through more universal support of and participation in such subjective organizations as EEI, the National Association of Electric Companies and the Edison Association of Illuminating Companies, and such objective activities as the Electric Companies' Advertising Program, the Public Information Program and Reddy Kilowatt. He pointed out that out of 305 Class A and B investor-owned companies only half belong to EEI, one-third to NAEC, 37% to ECAP and 20% support PIP. He reported that only 6/100 of 1% of the combined electric revenues of all 305 companies now goes for the support of these activities and of a total of some $3 million, approximately half is spent for the national radio and magazine campaigns.

Cryder

Common objective of all companies, he urged, should be to insure "advancing to higher standards, providing electricity in greater abundance and preserving that ideal which is the foundation of economic and political freedom, the rights of the individual to control his own affairs and regulate his own services in his own area to the fullest extent consistent with our national defense and the preservation of democracy."

"It is one thing to construct property with security holders' money and a totally different matter to protect that property and investment," John Loiseau told the convention. The latter job should be a primary responsibility of utility management today, he insisted. He traced the history of legislation adverse to utilities and assailed some of his contemporaries for failure to impress on the public the real significance of happenings detrimental to the public interest. He labeled the 1930-40 decade as a period when adverse legislation and adverse public opinion blossomed. The 1940-50 decade, he said, was a period during which the full effects of the developments of the previous 10 years became apparent and the industry awakened to their significance. The 1950-60 decade might well be a period of correction and rebuilding as witnessed by the favorable trend in both public opinion and legislation, he pointed out. (His full discussion will be published in the November issue of ELECTRICAL WEST.)

Such correction of public opinion and rebuilding of good will can be accomplished by telling the truth to the people, was the message of Edwin Vennard, Middle West Service Co. "The only reason we are in danger of losing our freedom," he said, "is ignorance." Management has the facts available to show the people that our system produces the things they want

IT WILL PAY YOU TO KNOW THE ANSWERS TO THESE ELECTRICAL WIRING MATERIALS PROBLEMS

1. Q. WHAT IS THE TWO-WAY PROTECTION OF "G-E WHITE"?

A. The hot-dipped galvanized finish on the inside and outside walls of G-E White rigid steel conduit is the first step towards long-lasting protection. But that's not all... both the inside and outside walls are further protected by a baked-on Glyptal* lacquer finish. The glass-like surface of this coating offers extra protection against corrosion... and makes it easy to pull wires through the conduit.

2. Q. WHY ARE MORE AND MORE ELECTRICAL CONTRACTORS AND MERCHANT BUILDERS INSTALLING G-E MERCURY SWITCHES?

A. Because home buyers, home builders, and tenants in commercial buildings are aware of and asking for the modern touch of the G-E silent mercury switch. Maintenance men prefer G-E mercury switches because they know that fewer moving parts mean longer switch-life and fewer service calls.

3. Q. WHAT IS AN EASY WAY TO SAVE TIME AND MATERIALS IN POWER CABLE INSTALLATIONS?

A. Use a flexible, ready-to-install cable that has a thoroughly impregnated varnished-cambric insulation and a sheathing of light-weight steel or bronze armor. Such a cable can be quickly run around obstructions, looped over beams, or hung up on racks... is suitable for permanent or temporary installations... can be easily taken down and used again in new locations. When you use G-E interlocked armor cable, insulated with long-lived G-E No. 1799 varnished-cambric cloth, you have a cable that meets all of these requirements.

4. Q. HOW CAN PROVISION BE MADE FOR LATER EXPANSION OF ELECTRIC WIRING IN COMMERCIAL BUILDINGS?

A. When a new building is being planned, make sure that the advantages of using G-E Q-Floor wiring are considered. This underfloor wiring system makes possible the installation of an outlet in any six-inch area of the floor surface... makes electrical facilities easily available when either office rearrangement or relocation of office partitions is necessary due to changing tenant requirements or when expanded facilities are needed. Even though construction may be held up today, it's not too early to get all the facts about G-E Q-Floor wiring.

HERE'S HOW TO GET COMPLETE INFORMATION ON G-E WIRING MATERIALS

Your G-E Construction Materials distributor can supply you with the latest information on wiring materials. Because he offers a comprehensive line of G-E wiring materials, he can help you with your wiring problems. Call on your G-E Construction Materials distributor for the wiring materials you need. There's a G-E Construction Materials distributor in every major market area ready to serve you. And remember also, for special engineering problems, communicate with either the Construction Materials district office in your area or the G-E Construction Materials Division at Bridgeport.

*Registered Trade-mark of General Electric Company

Section K69-1025, Construction Materials Division
General Electric Company, Bridgeport 2, Conn.

Please send me the free information which I have checked:

- ☐ Rigid Conduit Folder
- ☐ G-E Mercury Switch Folder
- ☐ Interlocked Armor Cable Booklet
- ☐ Q-Floor Wiring Data Manual

Name_____ Title_____

Company_____

Address_____

City_____ Zone____ State_____

You can put your confidence in—

GENERAL ELECTRIC

Boring Lenhart

Vennard Kyle Hibben

Peterson Rosch

in greater abundance than any civilization in history, and since management has these facts it has the key to freedom. He urged each utility to devote just 10 hours face to face with each employee, saying that they can be converted in that short time to support wholeheartedly our system whereby the people rule themselves.

In much the same vein Leo Brown of the American Medical Assn., Chicago, traced the fight of the medical profession for survival against socialized medicine. Paradoxically Brown reported that the electrical industry might well ask the doctors "where were you when our industry was first threatened with socialization?" He declared that, if private business cannot compete with the promises of the demagogue, it has no right to survive. "There is an urgent need in this country today," he said, "to sell principles as well as products, to sell ideals as well as service if our freedom and liberties are to be preserved."

"The price of freedom is never free," Robert R. Gros, director of publicity and advertising, Pacific Gas and Electric Co., told the convention, "it is payable only in human sacrifice." If we are to have peace in our time and if World War III is not to be inevitable, he declared that Americans must insist upon the truth, must demand leadership deserving of America and statesmanship equal to the courage and abilities of our fighting men.

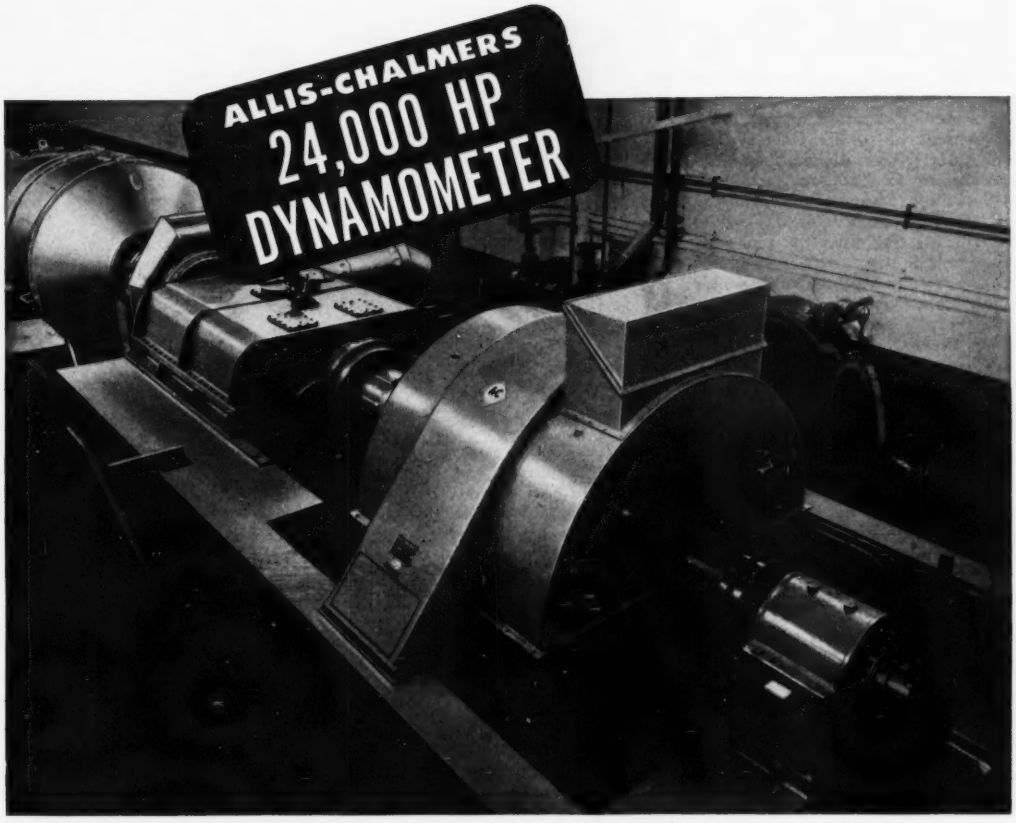
Complexities and effects of the critical material situation were developed by John S. Skillman, director, Technical Coordination Division, NPA, and W. D. Kyle Jr., president, Line Material Co. In pointing out what is happening to the nation's stocks of steel, copper and aluminum under the CMP plan, Skillman showed how the defense program is taking far more than the casually mentioned 20-25% of total supplies. On steel alone, he reported, direct military requirements plus industrial expansion for greater defense production will absorb 57% of fourth-quarter supplies. Headaches in making allocations under CMP have come from inflated requests both for tonnage and timing of deliveries, he said. Compliance teams are in the field currently checking 1,000 requests, he reported.

Kyle was not optimistic about the electrical manufacturers' ability to give utilities any more equipment than just enough to supply defense load expansion and to maintain systems at present levels of efficiency. Present 2- and 3-year capacity expansion programs may not be fully implemented as far as distribution goes, unless material supplies improve, he said. Large electrical manufacturers are expanding facilities to produce direct military equipment and smaller factories are substituting military work for regular production, because of their inability to get materials. Curtailment is not by the wishes or the design of the manufacturer, he declared, but by direction in the form of controls on materials, wages and prices.

Little hope for improvement in the technical manpower situation was held out by M. M. Boring, manager, technical personnel division, General Electric Co. Engineering graduates will drop from a postwar peak of 52,000 in 1950 to 17,000 in 1954 and half of these will be required by the military, he declared. In 1951, he said, 1,207 companies contacting colleges and universities sought 87,000 engineering graduates when only 38,000 were available. A survey of 620 companies employing half of the technical manpower in the U. S. revealed a shortage of 80,000 engineers. The survey showed that 25.6% of engineers employed by these companies held reserve commissions in the armed forces. Contrasted to America, he reported, Russia will educate 100,000 engineers in 1951. He urged every company to survey its own situation to determine if present engineering personnel is being used efficiently, if skilled technicians might substitute in some instances for engineers, if womanpower is being employed and if educational programs can be used to upgrade technical people.

How synthetics are playing and will continue to play an increasingly important part in industry and the home was told vividly by S. J. Rosch, engineer, Anaconda Wire & Cable Co. He demonstrated how catalysis and polymerization are helping the chemist produce a wonderful array of materials and products from gas, water and air and showed examples of how neoprene, vinyl resins, polyethylene and nylon are making better conductors available to the electrical industry. "Whether you like it or not," he said, "you'll soon be a walking example of synthetic chemistry."

Asking the questions "Where have our salesmen gone?" and "why do salesmen fail?" A. W. Peterson, Western region utility sales manager, Hotpoint Inc., set up 10 tombstones to answer his queries. A recent survey showed 10 reasons for salesmen's failures as follows: not industrious, 31%; inadequate knowledge, 14%; failure to follow policy, 10%; lack of fighting spirit, 10%; lack of determination, 10%; lack of enthusiasm, 8%; dishonesty, 8%; lack of courtesy, 4%; bad habits, 4%; and poor health, 1%. "Since we know what good salesmanship is, what it has done for America



Another Example of Allis-Chalmers Engineering

DESIGNING AND BUILDING this special power-delivering dynamometer required engineering skill available only to a company such as Allis-Chalmers with its century of engineering experience.

Arranged for direct measurement of torque, the dynamometer has an accuracy of ½% of the rated torque. Its overall speed range is 1210 to 15,072 rpm. And the 24,000 hp synchronous motor and its speed-increasing gear are supported by a special hydrostatically mounted base. Although the assembly weighs 130,000 pounds, it is so well balanced and cradled that it can be moved by the pressure of a man's finger.

The dynamometer was built for the Pratt & Whitney Aircraft Division of United Aircraft Corporation for testing turbo-jet engines. Allis-Chalmers also supplied the torque measuring equipment, metal-enclosed bus duct and switchgear.

Whether you need special or standard equipment—for power generation, distribution or utilization — you can benefit from this engineering experience by calling your nearby A-C representative. Allis-Chalmers, Milwaukee 1, Wis.

A-3501

ALLIS-CHALMERS

A-C ALLIS-CHALMERS

and what it holds for the future, let's not lose it," he pleaded. "Good sales management, supervision and guidance can turn our tombstones into touchstones."

Television is creating a minor revolution in our way of life, David Davis, national television sales manager, General Electric Co., declared in an up-to-the-minute review of TV. Some of his revelations included the following: the whirring disc system of color television will be supplanted by an electronic system. Phonevision, while highly controversial, may solve the problem of telecasting to minority groups of viewers. Recent surveys indicate a potential of nearly 2,000 TV stations of which 1,230 may be UHF channels, principally in cities of less than 250,000 population. This fall and winter TV will offer the greatest weekend concentration of big-name shows in the history of the show business. He painted a stimulating picture of TV in education, entertainment, culture and in business and industry. (His discussion will be presented in detail in an early issue.)

Light is one of the best avenues to favorable public opinion and incidentally to additional revenues, according to Sam G. Hibben, director of applied lighting, Westinghouse lamp department, and president of the IES. He urged that the industry tell the story of light to the public in homely, understandable language rather than in technical terms.

"We have one great job to do, namely, to develop the seeability of the average man on the street," Hibben declared. "We must do this because the average man's visual functions depreciate approximately 3% per year. Hence we must give him good light for his seeing tasks. Never before in our history have we had more knowledge or more and better tools for doing this job. For proof he demonstrated a variety of the equipment and tools available to the industry.

New Officers

James M. Cryder, president of Colorado Central Power Co., Englewood, was elected president of the league, succeeding Heffelman. Vice-presidents for the new term are: D. W. Reeves, Public Service Co. of New Mexico, Albuquerque; M. M. Koch, Publice Service Co. of Colorado; W. L. Breslin, Western Public Service Co., Laramie, Wyo.; H. L. Davin, Bussman Mfg. Co., Denver. C. S. Sterne, Arvada Electric Co., Denver, is treasurer and Harry Adler, of the same company, is assistant treasurer.

Los Angeles NECA committee that made such a successful garden party at its own residence headquarters, Sept. 14; Jack Rollins, Harry H. Keith, Patrick Hannon, R. F. Doll, Warren Penn, Max Fry, Richard Arbogast. Allen Fishback, not in picture, was on committee too. About a hundred members and their wives enjoyed annual social event

When F. Jack Rohring, So. Calif. Edison, at right, was elected president of Electrical Maintenance Engineers Assn. of Southern California, he held this staff huddle with other officers: Henry R. Bente, Albert C. Martin & Associates, secretary-treasurer; Hal Davis, General Electric, immediate past president; George Larsen, Larsen-Hogue Electric, first vice-president; Richard Rogers, Ace Day & Night Electric, second vice-president

Bureau of Home Appliances of San Diego County elected these faithful workers as its new officers at a recent annual election: R. T. Redfield, Graybar, immediate past president; George Stoltenberg, La Mesa, first vice-president; Gordon Dawson, Dawson & Co., president; Ted Williams, Dennstedt's Electro Mart, second vice-president and Sam L. Hall, Electric Supplies Distributing Co., treasurer. Dawson's store is at Ocean Beach. He has been a board member for several years, is chairman of new TV committee

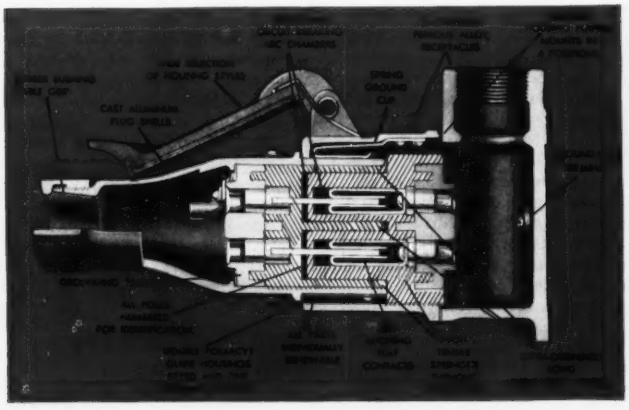
SAFE • DURABLE • DEPENDABLE

PYLE-NATIONAL

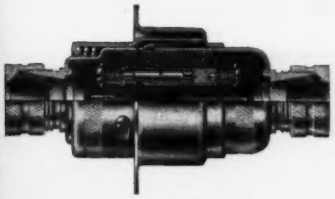
Heavy Duty Plugs and Receptacles

FOR PORTABLE ELECTRICAL EQUIPMENT

Pyle-National plugs and receptacles are built to withstand the most severe operating conditions, as proven by years of remarkably dependable service in a wide variety of industrial applications. The many substantial construction features of this extensive line of plugs and receptacles and the high quality of materials and workmanship insure safe operation, uninterrupted service and long life.



QuelArc* • *Circuit Breaking Series* **Unique partitioned insulation provides long insulated paths through air and across surfaces for exceptional protection in these current rupturing devices. Cast metal housings, high grade insulation and individually renewable contacts insure long service life. Ratings 20, 30, 60, 100 and 200 amperes, 250 volts DC, 600 volts AC—2, 3, and 4 pole—grounded through shell or extra pole. Threaded cap, plain and hinged spring door housing styles are available.**



Interchangeable reversible contact units. 1, 2, 3, 4, 6, 8 pole

Triploc* *and Multiple-Circuit Series*

A line of exceptional versatility, unequalled in the heavy duty field, with a virtually unlimited number of assembly combinations for varied applications. Offers a selection of 1, 2, 3, 4, 6 and 8 pole contact units which are interchangeable and reversible in any single set of housings. Many types of housings available of pressed steel with automatic lock and of cast metal threaded for watertight gasket seal. Multi-Circuit housings with 2, 3 and 4 contact units available for combinations up to 32 poles. Ratings 15 and 20 amperes, 250 volts DC, 460 volts AC —circuit breaking. Pressed steel fusible and fuseless plugs measure only 1 13/16" outside diameter.

Midget Triploc* *Series* **Same construction features as Triploc except for much smaller outside diameter of plug shell—only 1¼". Interchangeable and reversible contact units—2, 3 and 4 pole—are of the flat blade type. Rated 10 amperes, 250 volts; 15 amperes, 125 volts.**

General Purpose *Series* **Available with cast metal housings in many types for circuit breaking and disconnect service. 30 amperes, 125 volts DC, 250 volt AC—1, 2, 3, 4, 5 and 6 pole. 60 amperes, 250 and 600 volts—3, 4 and 5 pole. 100 ampere, 250 and 600 volts—2, 3 and 4 pole. Also many special types, fusible and fuseless, for varied applications.**

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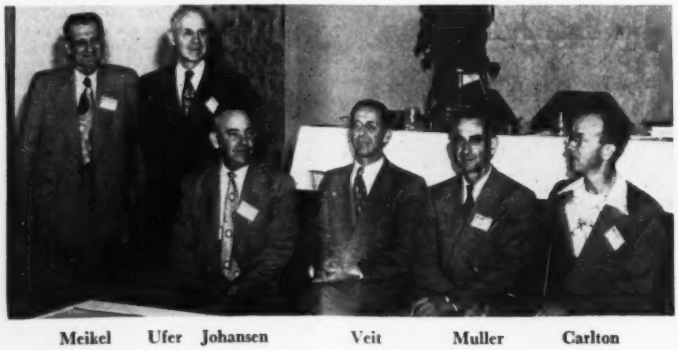
IAEI code panel, Long Beach: Smith, Johansen, Muller, Trim, chairman, Ufer, Lundberg, Gerber, Brandon, Demanty, Dobson, Maxwell

Inspectors Consider Code—and Finances

Inflation has caught up with inspectors—both as to salary checks and in operating their association, the International Association of Electrical Inspectors. While revisions to the National Electrical Code were the main topic on the program of both Southwestern and Northwestern Section annual meetings, the main problem in the background was money—dues for the association, salary for the inspector. Once or twice material shortages reared their ugly heads only to be told off by disbelieving inspectors who so far haven't wanted to accept such a reality. The meetings were at Long Beach, Sept. 13-15 for the Southwestern, and Spokane, Sept. 19-21 the Northwestern Section.

The report of the dues structure committee, which recommends a raise in all classes of dues, was discussed more in executive committee session than on the floor. It is to make the rounds of all section meetings before being acted upon. Arthur C. Veit, international president, Los Angeles county electrical inspector, reviewed this problem in his presidential address to each section.

Veit traced the history of the formation of the International Association through the consolidation of several sectional associations. "We should be proud of our membership and consider it a privilege to have a part in an association such as ours which has nothing to sell and whose members devote their entire efforts to serving the public which they represent — a service which the public cannot obtain elsewhere," he said. Then he paid tribute to the international secretary and section and chapter secretaries, told of the tremendous amount of work they do voluntarily and of the need of the association for more funds to permit more committee meetings rather than attempt to carry the entire business of the organization by slow correspondence. The city or type F memberships suggested by H. G. Ufer, secretary of the Southwestern Section, and taken by 75 cities in California, seven in Arizona and three in Nevada, has been one means to increase revenue. But more are needed. Veit commended the dues structure committee report to the members' attention.



Meikel Ufer Johansen Veit Muller Carlton

Three other speakers and Charles L. Smith, IAEI secretary of Chicago, addressed both section meetings, Frank E. Hodgdon, chief engineer, American Gas Assn. laboratories; V. G. Mulligan, Ideal Industries Inc.; and J. C. Platt, General Cable Corp.

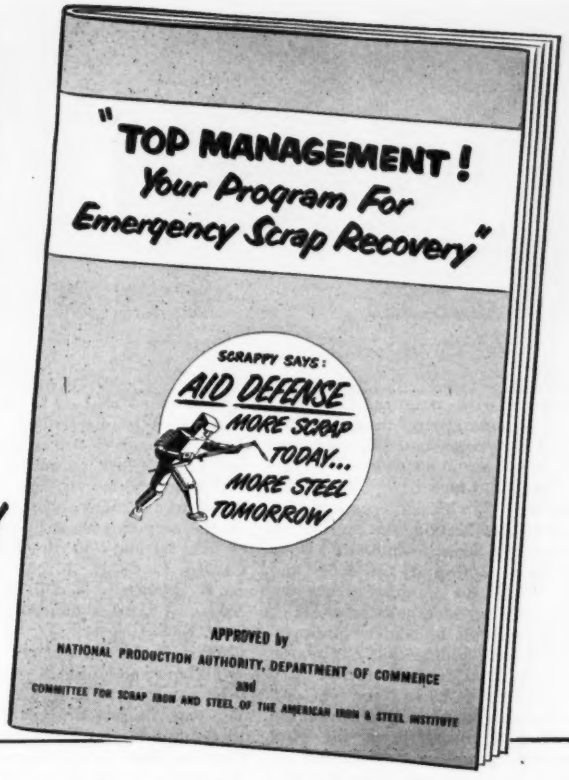
How the laboratories of the American Gas Assn. dovetail with the work of the IAEI was explained by Frank E. Hodgdon, chief engineer of the AGA Laboratories. This organization uses the facilities of the Underwriters' Laboratories and Electrical Testing Laboratories in addition to its own facilities in establishing standards and testing the electrical components of gas appliances.

The history of pigtail splices with emphasis on all the common methods of making these splices was presented by V. G. Mulligan, Ideal Industries Inc., to aid the inspector in an understanding of the proper methods. Most failures of splices are caused by improper application of the method, he pointed out.

J. C. Platt, General Cable Corp., explained the construction of a new wiring system in which the conductors are encased in a copper sheath and

What YOU can do... Must do

to ease the critical iron and steel scrap problem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It's a problem calling for the assistance of every thoughtful business man—now.

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If you're in the steel-fabricating business, you have extra *dormant* scrap to be added to your *production* scrap.

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Write for Suggestions. The booklet shown here tells how to set up a Scrap Salvage Program with least amount of effort and minimum interference with your regular operation. It tells where to look for scrap, what to do with it when you get it.

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FACTS ABOUT SCRAP SALVAGE

Steel production	1950 — 97,800,000 net tons
Estimated capacity	1952 — 119,500,000 net tons
Purchased scrap used*	1950 — 29,500,000 gross tons
Estimated purchased scrap requirement*	1952 — 36,200,000 gross tons

*All consumers

Where will the extra tonnage come from? Mostly from your *dormant* metal—obsolete machines and structures, tools, jigs, fixtures, gears, wheels, chains, track.

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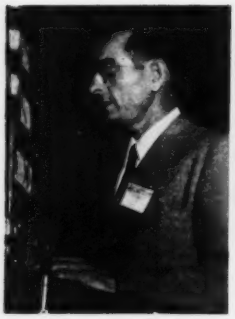

Muller

Oliver

Platt

Mulligan

insulated with magnesium oxide, which does not give off toxic gas when heated. He demonstrated how this new cable stood up under violent mechanical shock and high heat.

Edward V. Muller, president of Southwestern Section, also touched on finances. He likewise spoke of efforts to achieve uniformity in codes and rules. "Until the reasons for enacting local rules are clearly understood, it will be difficult to achieve uniformity," he said, adding that one reason was that local authorities feel they have no voice in making the NECode. On the other hand members are often unwilling or unable to do the extra work that committee participation involves. Since the code does not give reasons for its rules, the inspector should be able to give them to the public when it asks. If an inspector cannot, then he should consider changing them.

Two additional speakers appeared on the Southwestern Section program —W. J. Alcock, former president of the Western Section, of Underwriters' Laboratories Inc., Chicago; and R. W. Stange, assistant general manager, National Board of Fire Underwriters, San Francisco. Alcock explained the differences between UL label service and re-examination service and the limitations as well as the identification of each. He then answered a number of questions from the floor. Stange gave an excellent appraisal of the value of the electrical inspector to the community and the industry, pointing up the inspector's responsibilities.

M. M. Brandon, who recently was appointed to the position held for many years by A. R. Small, as head of the electrical coordinating committee on the National Electrical Code, attended both meetings and participated in code panels and discussions. He also took occasion to explain procedure used in receiving and processing proposed changes to the code.

A panel headed either by L. O. Trim, Burbank electrical inspector, or by H. L. Gerber, consulting engineer and former inspector, San Francisco, answered questions and led discussion on the proposals made by committees of the section. On the panel were Charles L. Smith, M. M. Brandon, R. B. Maxwell, A. C. Veit, A. P. Vesco, N. V. Dobson, M. E. Lundberg, K. S. Geiges, T. Demanty, E. E. Carlton, D. H. Hansen and others.

This year no especially controversial issue came up. The section however did vote to put through processing three important additions to the code. One was that the provisions in California's Safety Orders for moving picture studios be adopted. Another was to make a new article on electric heating applications and a third to incorporate in the code a successfully used list of rules on installation of low-voltage control wiring now in many California local ordinances.

Once more—and for the third time —the section repeated its request that Article 240 be made to require overcurrent protective devices (fuses and circuit breakers) to clear the circuit instantly to prevent excessive burning and arcing at point of fault. It asked that all 15- and 20-amp devices in dwelling occupancies be of the time-delay type and clear the circuit instantaneously at any current over 100 amp. Also that ranges, heating devices and other appliances whose load is essentially noninductive be protected by overcurrent devices that will clear the circuit instantaneously at any current more than 100 amp. It added this year a request to require that circuit breakers used for the protection of 15- and 20-amp branch circuits in dwelling occupancies shall not be interchangeable with breakers of higher ratings.

Watson Brandon Tansey

Officers elected at the conclusion were: R. D. Johansen, Alameda electrical inspector, president; C. R. Meikel, Bakersfield, first vice-president; E. E. Carlton, California Division of Industrial Safety, second vice-president; and H. G. Ufer, Underwriters' Laboratories, Los Angeles, secretary-treasurer; R. B. Maxwell, San Jose, member of executive council replacing B. F. Wiesinger, retired. New members on the executive committee will be E. V. Muller and L. B. Sterling. Fresno was selected as the place for next year's annual meeting.

Northwestern Section

A review of the Articles of the National Electrical Code, with an eye on needed revisions, dominated the program of the 25th annual meeting of the Northwestern Section, IAEI, in Spokane Sept 19-21. Part of each day's program was devoted to this review, with a panel of code experts available for explanation and discussion. This panel consisted of Merwin Brandon, chairman, Electrical Section, NFPA; Charles L. Smith, international secretary of IAEI; W. R. Volheye, chief electrical inspector of Oregon; John C. Hewitt, chief electrical inspector of Washington; C. S. Alger, Puget Sound Power & Light Co.;

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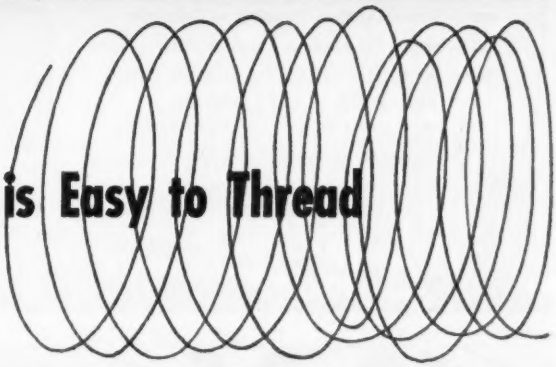
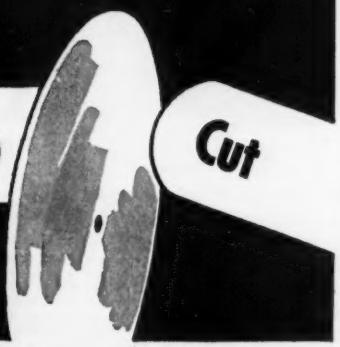


SPANG CENTRAL

Conduit is Easy to Cut



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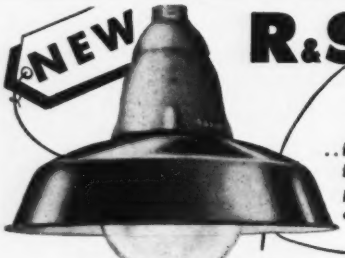

..for hazardous locations where flammable or explosive dusts are present. Class II, Groups E, F, G and Class III.

With 2 Exclusive Design Features

1 Lampholders are located within the conduit box assembly of both pendent and junction box types, permitting installation and wiring without regard to size or style of fixture.

2 All fixture — globe — Reflector assemblies fit either base and are easily attached or interchanged by means of a simple bayonet slot and screw arrangement, without disturbing electrical connections.

R & S Type DL Lighting Fixtures contribute outstanding advances in fixture construction and installation simplicity! They operate very cool — 'way below allowable temperatures for this type of installation.

Two *exclusive* design features, in addition to basic advantages common to other well-constructed dust-tight fixtures, assure faster, easier installation, cleaning and relamping. They're made of cast aluminum alloy — designed with streamlined simplicity — and shaped to prevent dangerous accumulation of dust particles. Write for Information Data Sheet No. 7151-10.

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John H. Watt, electrical inspector of Seattle; R. J. Larrabee, Underwriters' Laboratories; and C. M. Kirsop, chief electrical inspector of Olympia.

L. B. Garff, electrical inspector of Tacoma and president of the Northwestern Section, and Chris Klawa, electrical inspector of Portland, first vice-president, divided presiding responsibilities. Roy E. Crosby, Washington Water Power Co., Spokane, headed the local committee. A golf tournament, the annual banquet, presided over by Carl L. Hoffman, Washington Water Power Co., and a trip to Grand Coulee Dam were the principal extracurricular activities.

After a welcome by Arthur R. Meehan, mayor of Spokane, and response by Walter Toly, president of Columbia Electrical Mfg. Co., Spokane, came the address of Arthur C. Veit, international president.

L. B. Garff paid high tribute to the work of the section in safeguarding electrical users in the Northwest against the hazard of fire and accident through diligence in administering the electrical laws and ordinances in the area.

The report of W. L. Gaffney, section secretary-treasurer, showed a gain of 90 members during the year and a healthy financial situation. The reading of chapter reports was dispensed with but the following filed written reports for the record: Rankin C. Young for the Idaho Chapter, A. E. Fleming for the Utah Chapter, Roy E. Crosby for the eastern Washington Chapter, Paul L. Miller for the Oregon Chapter, C. S. Alger for the Puget Sound Chapter and H. W. Johnson for the Tacoma Division of the Puget Sound Chapter.

Thomas W. Delzell, Portland General Electric Co., speaking from the standpoint of the electric utilities, paid tribute to the teamwork of the manufacturer, the contractors, the dealer, the utility and the inspector in bringing safe and dependable power to users who are demanding more and more electrical service in their homes, commercial establishments and industries in the region. Enough power today will not be enough tomorrow, he pointed out, as the increasing demand has finally forced an impending power shortage in this, the driest of many seasons. New capacities brought in by the federal government, the large municipal power operations and the private utility companies will lick this situation, he said, and all encouragement should be given to local distributing agencies, whether private or municipal, to develop such capacity as they can, thus relieving the tax-

payer of making all the investment in power plants through federal developments. Hundreds of thousands of potential kilowatts are being delayed by political controversy, he said, and a line of demarkation between federal and local participation should be fairly drawn to encourage immediate and long-term development of water resources at the local level.

Increasing popularity of bus duct in industrial applications was prophesied by T. E. Ashley, Westinghouse Electric Corp. Though bus duct has been on the market for 20 years, it has gained popularity chiefly since the war. Ashley explained the design of the principal types and illustrated their application in commercial buildings, banks, hospitals, schools and industrial plants.

Only one code breakfast instead of two was held, with W. R. Volheye, Portland, as chairman. The meeting voted to discontinue holding code breakfasts but to meet in general session earlier than normal meeting time, and devoting this extra time to formal discussions of the code in which action could be taken on proposed revisions. Four code panel discussions were held, consuming several hours of the regular sessions. No sweeping changes were recommended but many minor revisions were approved to be forwarded through channels to be reviewed by the correlating committee.

Officers elected for the coming year were: President, Chris Klawa, Portland; first vice-president, Rankin C. Young, Boise; second vice-president, John R. Crawford, Butte; secretary-treasurer, W. L. Gaffney, Tacoma. Gaffney was likewise re-elected to the executive council. Executive committee members were: L. B. Garff, Tacoma; John C. Hewitt, Olympia; Cliff Atkins, Portland; O. A. Alderman, Seattle; J. D. Gawne, Seattle; T. M. Widrig, Seattle; and J. Hyde Stavner, Salt Lake City.

Twin Falls, Idaho, was selected as the annual meeting city for the 1952 meeting, and Portland for the 1954 meeting. In 1953 the section will meet jointly with other sections in Chicago.

IAEI

The newly organized Eastern Washington Chapter of IAEI met recently at Wenatchee and elected Pat Sampier, Walla Walla city electrician, as its chairman and Roy Crosby, Washington Water Power Co., Spokane, its secretary. Northwestern Section Secretary William Gaffney and Ray Larrabee of Underwriters' Laboratories, Seattle, participated in the initial meeting.

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● Paranite Hydro-Therm combines in a single wire the heat-resistant qualities of Type RH and the moisture-resistant qualities of Type RW.

USED IN DRY LOCATIONS Paranite Hydro-Therm carries more current per dollar of cost. The higher amperage rating for Type RH wire under the National Electrical Code provides greater current carrying capacity. You can use smaller conductors, smaller sizes of conduit; and lower your labor costs.

USED IN WET LOCATIONS Paranite Hydro-Therm is rated as Type RW wire for 60°C operation because of its excellent moisture-resistant qualities.

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WESTERN HOME OWNERS prize their trees . . . select their tree service with care. That's why they always appreciate the quality and safety of line clearing by Davey. For Davey line clearing insures safety of life and property as well as the trees' welfare and is the best as well as the best known.

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THE MONTH IN BRIEF

Interruptible Power Restored in Northwest

Rainfall in the Northwest had relieved the critical power situation somewhat as this issue went to press. Earlier BPA had withdrawn 245,000 kw of interruptible power from aluminum and electroprocess companies; had called on the professional rainmakers to help and had contracted with Water Resources Development Corp. of Denver for cloud-seeding operations in the upper Columbia River drainage basins of Pend Oreille, Clark Fork and Flathead Rivers. Order of Charles E. Wilson, national mobilization director, that Pacific Northwest aluminum plants prepare plans for moving some of their potlines to regions of assured power supply was greeted with amazement. Kaiser officials at Spokane said that it would take at least a year to build new plants and another six months would be required to dismantle and move the machinery. (See story p. 116.)

Arizona Merger Being Considered is Report

Merger of Arizona Edison and Central Arizona Light & Power Co. last month was reported about where it was when negotiations collapsed in 1947. The proposal is supposed to be presented to an Arizona Edison directors' meeting early in October.

Montana Power Would Bring Gas from Canada

Montana Power Co.'s request that hearings on its application for authority to import natural gas from Canada be transferred from Billings to Helena was denied by FPC, but further hearings will be held in the latter city. Montana Power would import gas from the Pakowki Lake area in southeastern Alberta. Two newly formed subsidiaries would produce and transmit gas in Canada.

PG and E Schedules Pittsburg Plant

A 600,000-kw steam-electric plant to cost $80 million will be built by Pacific Gas and Electric Co. on the San Joaquin River, seven miles downstream from the company's new Contra Costa plant. The 230-acre site west of Pittsburg, Calif., cost nearly $350,000. Four 150,000-kw units, larger than any on the company's system, were ordered last April before the location had been determined. Ground breaking will take place in October. The first two units are scheduled for operation late in 1953 and the other two early in 1954. Bechtel Corp. will be the general contractor.

Fuel Oil Reserves Drop

Fuel oil reserves on the West Coast are reported down to 17 million barrels. Reserves reached a high of 85 million barrels during mid-1950 and a low of 14 million during World War II. No serious shortage is expected next winter, according to industry spokesmen although 17 million barrels are considered a minimum safe operating level.

Labor Will Fight for Free Enterprise, Tracy Says

Public power planners in Washington are recognizing and becoming alarmed at Labor's efforts on behalf of the free enterprise system, IBEW President Dan Tracy said last month in a talk before the San Francisco Electric Club. Labor will continue to fight for the principle of maintenance of free collective bargaining and therefore free enterprise despite peace feelers from those on the side of public power, he declared.

Grand Coulee Power Plant Completed

The eighteenth and last 108,000-kw Grand Coulee generator went on the line Sept. 15, giving the power house a rated capacity of 1,944,000 kw. Three house generators are rated at 10,000 kw each.

More Facilities Planned for Los Angeles

Additional electric power facilities will be made available in several sections of Los Angeles at an estimated cost of almost $2 million under the Department of Water & Power's expansion program, according to Charles P. Garman, chief electrical engineer and deputy general manager. Two electric distributing stations are under construction, work is to start on a third soon and a fourth station will be expanded to double its present capacity.

SEC Will Hear Arguments on Cowlitz Dams

Tacoma will continue its fight for an FPC license for the projected Cowlitz development when oral arguments are presented before the commission Oct. 31. An FPC examiner recommended that no license be granted because the project would interfere with fishing resources of the Cowlitz. E. K. Murray, special counsel, and J. Dean Barline, assistant corporation counsel, will represent the city. The commission also will hear from the Washington State Department of Fisheries and Game, the Washington State Sportsmen's Council and the FPC staff counsel.

Utility Purchase Included in Budget

The proposed 1952 budget of the Ellensburg, Wash., Municipal Lighting Department includes a capital outlay of $100,000 for proposed purchase of Puget Sound Power & Light Co. properties within the city. The facilities would be taken over by the city in a mutual undertaking with the Kittitas County PUD, according to Edward N. Allenbaugh, light superintendent.

Eugene Makes Offer for Facilities

An offer to purchase a portion of the Mountain States Power Co.'s distribution facilities immediately north and northeast of Eugene, Ore., has been made by the Eugene Water and Electric Board. Approximately 1,500 customers are served by Mountain States in that area. The company has taken the offer under consideration.

Here's Why You Get Extra Service with VICTOR TRANSMISSION PINTYPES

VICTOR Transmission Pintypes give extra long life because they're designed for severe service and made to rigid specifications. Each is thoroughly inspected at every point of manufacture. Performance data proves they furnish years of trouble-free service! Choose VICTOR—the finest insulators skilled craftsmen and modern methods can produce!

V UNEQUALLED STRENGTH! VICTOR'S de-airing process produces porcelain of maximum density, strength and resistance to impact.

V LARGE RADIUS TOP AND SIDE WIRE GROOVES make hot-tying quick and easy.

V QUALITY CONTROL! All shipments of flint, feldspar, and clay are stored in separate bins and tested for quality and purity before use.

V CUSHION COATED JOINTS absorb thermal variations and mechanical shock.

V CONTROLLED TESTING and **PROCESSING** of cement assure highest bond strength at assembly joints.

V SMOOTH, HARD GLAZE protects against weathering and contamination, assists self-cleaning, reduces maintenance and replacement costs.

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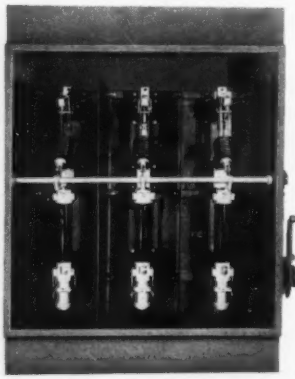
Since more factory power is being supplied at high voltage to convenient load centers, high voltage switches take on added importance.



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Three E Air Interrupter type will give you the utmost. They can be opened under loads to 600 amperes at 15000 volts. Magnetizing currents of transformers and charging currents of lines and cables are also successfully interrupted.

Interruptions are performed without external arcing and without use of oil or other inflammable liquids.

Used with power fuses, as illustrated, they provide complete circuit protection at exceptionally low cost.

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THIS MONTH'S NEWS

Interruptible Power Curtailed in Northwest

An order withdrawing 245,000 kw of interruptible power from Pacific Northwest aluminum and electroprocess companies was issued by Bonneville Power Administration on Sept. 17. The order was modified immediately by DEPA to the effect that cuts would not apply to Pacific Northwest Alloys, Spokane, which produces magnesium; Pennsylvania Salt Co., Portland, which supplies the government with chlorates, and Hanford Atomic Energy plant.

Low stream flow in the Columbia and its tributaries is responsible for the curtailment. D. L. Marlett of BPA estimated the drop in hydro production at 100,000 kw per day. Under conditions prevailing at the time the order was issued 600,000 kw of a total of 2,600,000 average production was labeled critical.

Approximately half of this amount was being taken care of by the cut in interruptible power. The rest was to be made up from general curtailment in use of power, possibly including a general brownout.

Some help was the return of 175,000 kw when irrigation pumping at Grand Coulee was halted Sept. 20.

Steam generation was being used to the fullest. Steam plants in the area can produce 306,000 kw and 40,000 kw was being brought in from Utah plants. About 200,000 kw of steam generated electricity was being used before the critical situation arose. Cost of steam generated power runs from 8 to 10 mills per kwh., as compared to approximately 2 mills paid to Bonneville by industrial customers.

Three Oregon power companies have applied to the state public utilities commissioner for authority to collect surcharges ranging from 5 to 30% to reimburse them for cost of operating steam plants during emergency.

Washington state communities that operated on daylight saving time during the summer decided to revert to standard time Oct. 1 since it was agreed that extension of DST would save little or no electricity. Housewives were being asked to help by curtailing electric use during peaks. J. H. Gumz, loaned by PG and E to DEPA, has been named northwest area representative of the agency.

Not, PLEASE, In the Name of Fairness

Our national Office of Economic Stabilization has adopted a policy of gearing wages to the cost of living. We are told that "escalator clauses," which provide that rates of pay shall be adjusted to take account of changes in the cost of living, will be generally approved.

If the adoption of this policy had been announced as a frank concession to political expediency, it would have been quite understandable. There may very well be votes, lots of them, in a policy which purports to protect the income of a large group against loss through the price inflation caused by the defense program.

A case might even have been made for a policy of approving escalator clauses on grounds of production expediency. The leaders of some three million organized workers now covered by such clauses have indicated that they would fight to the limit to keep them and thus maintain "real wages," that is, wages measured by their purchasing power. The leaders of other organized groups have indicated they would fight to get the benefit of such clauses. Denial of them might mean serious strikes.

Justified "in Fairness"

However, the policy of approving escalator clauses was not based on these relatively low grounds of expediency. It was justified on high moral grounds, on grounds of "fairness." In the words of the President's Council of Economic Advisers, "maintenance of real wages during inflation cannot in fairness be disallowed."

That proposition is false.

It would be truthful to say, "maintenance of real wages during inflation cannot in fairness be allowed."

The truth of the corrected proposition becomes evident immediately when you take a look at the basic nature of the inflationary problem created by defense mobilization.

We are devoting a large share of our national production to defense. The share is now scheduled to hit about 20% in 1952.

Since we are not able to increase our total production fast enough to meet defense needs

in addition to civilian needs, that means a cut in the supply of goods and services that is available for civilian consumption. But the money paid out for the production of defense materials is added to that which is available to buy civilian goods.

Thus, more money is put into the hands of the people to buy less goods. So prices go up. That is inflation.

If one group of people then is granted enough additional money to offset the price increases — and that is the purpose of an escalator clause — and thus can continue to buy as much as they have been buying right along, less goods will be left for other consumers who are not getting this advantage. That is palpably an unfair distribution of the sacrifices necessitated by defense mobilization. In fairness, therefore, maintenance of real wages in inflation cannot be allowed.

Organized workers were not the first, of course, to get the benefit of an automatic adjustment to take account of the increased cost of living. The farmers got theirs first. The price parity formula is, in essence, an escalator clause. The federal government underwrites increases in the prices of the things farmers sell in order to match increases in the prices of the things they buy.

Crucifying the Helpless

As matters stand, two groups are without benefit of escalator clauses. One group is composed of manufacturing firms. While they have not been nearly as successful as the misleading reports of "record-breaking profits" suggest, they have been able to look after themselves fairly well — thus far.

But one group is completely without protection. It is that numerically large but politically unorganized mass of people — many of them old and relatively helpless — who are trying to live on pensions, annuities and other fixed incomes derived from their savings. They are at the end of the line when the increased costs of inflation are passed along. They have no one to whom they can pass the buck. They are being progressively pauperized by the continuing inflation caused by progressive boosting of costs and hence prices.

With the present line-up of pressure groups in Washington, protection for the principal victims of inflation — those who have saved for a rainy day only to find inflation has blown away the roof — is obviously an extremely difficult business. But to have even temporary insulation against inflation granted to powerful groups in the name of fairness should be offensive to the nostrils of a nation that presumes to assert the moral leadership of the Western World.

The only really fair way to handle inflation is to prevent it. But once it is under way, fairness demands that the burdens be as evenly distributed as practicable.

An escalator clause — or a farm parity provision — is explicitly a device to enable the group favored by it to escape the burden of inflation. Whatever concessions we feel we must make to political pressures or production expediency, let us at least be honest enough not to invoke "fairness" as justification for so arbitrary a discrimination in the distribution of the defense burden.

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OPS WOULD INTERVENE IN UTILITY RATE CASE

The Office of Price Stabilization last month asked to intervene in Pacific Gas and Electric Co.'s application for an electricity rate increase before the California Public Utilities Commission.

The OPS petition stated the increase may be "contrary to the purpose of the Defense Production Act." It holds that increases in rates would boost the parity formula in agricultural products, raising the legal price limit and directly affect the consumer.

In July, OPS entered the hearing on a rate increase sought by California Electric Power Co. in southern California.

City Council Planning Increased Utility Tax

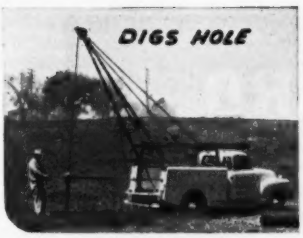
Preparation of an ordinance that would increase the municipal tax on Seattle City Light's gross income from the present 3% to 4% has been directed by the finance committee of the city council. The increase would raise an additional $280,000 annually. The telephone and gas companies now pay 4% on their gross income while the municipal water department pays a 6% utility tax. Tax on the municipal transit system would be increased from 1¼ to 2%.

City Light to Pay County $21,000 Yearly

Legal endorsement has been given by Corporation Counsel A. C. Van Soelen, Seattle, to a proposed $21,000 annual contribution by Seattle City Light to Whatcom County, in which City Light's Skagit River power plants are located. Payments will begin next year and continue until January 1961. Van Soelen advises that state law authorizes cities to make such contracts.

Company Wins Suit Against State of Washington

General Electric Co. was favored in a suit against the State of Washington for more than $1 million in taxes paid since 1946, under a ruling by Charles T. Wright, Thurston County Superior Court judge. The opinion rules that the G-E Co., as contractor to the Atomic Energy Commission, is exempt from state business and occupation taxes, basing the decision on the Atomic Energy Act. The state was expected to appeal the decision.



New "325" Attachment . . . Derrick and Digger Unit

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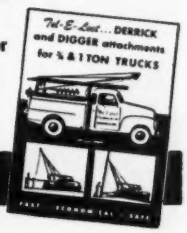

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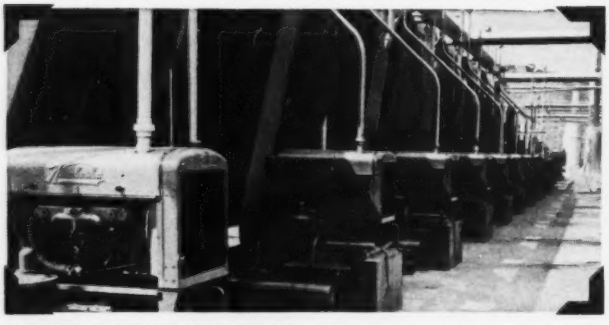

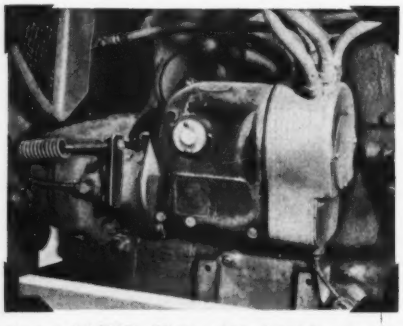

144 HIGH-SPEED BEARINGS in 72 magnetos on various types of engines required servicing at 1- to 3-month intervals until Calol O.H.T. Grease was used on them. Now they are serviced only at intervals of 3 to 6 months, although heat from the continuously operating engines keeps "drive-end" bearings at an average temperature of 160°F. Three other brands of comparable type grease tried by Sunray Oil Corp., owners of the engines, would not stay put on the magneto bearings under these tough conditions. Calol O.H.T. Grease has lubricated bearings satisfactorily in temperatures up to 400°F.

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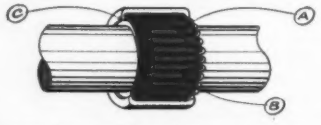

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FIRST STEPS TAKEN ON FEATHER RIVER PROJECT

First steps in the recently approved Feather River project construction were taken when the California Water Project Authority gave the go-ahead for filing application with FPC.

The state is asking permission to construct, operate and maintain dams, reservoirs, and power facilities at the Feather River project's key site, the $400 million Oroville Dam and Oroville afterbay dam.

State Engineer A. D. Edmonston, who presented the project to the last state legislature, has been authorized to negotiate with public and private agencies in connection with the Oroville reservoir, including rerouting a section of the Western Pacific Railroad, and 20 miles of state highway.

The project, heralded as second in importance to the Central Valley Project, will divert about 3,500,000 acre-ft of water to areas as far south as San Diego. Also planned is a $64,500,000 power plant, and $19 million worth of transmission lines and substations.

Third Coulee Power House Asked by Representative

Rep. Henry M. Jackson of Washington state has asked the Bureau of Reclamation to start engineering work on a third Grand Coulee power house, with a capacity of 750,000 kw and costing $150 million. Installation of the final generator in the second power house has just been completed, giving the dam a total capacity of about 2,000,000 kw.

Jackson said he expects the bureau to ask a supplemental appropriation for the preliminary work, which could start next fall and be completed within three years.

The third power house would involve a tunnel about a mile long around the end of the dam. Additional storage will be necessary to make the new power house completely effective, Jackson admitted, but at least part of this storage would be provided by Albeni Falls Dam now under construction in Idaho.

● **FPC** has granted an 18-month preliminary permit to the County of Placer, Calif., a proposed hydroelectric power plant on the North Fork of the American River, near the existing North Fork Debris Dam. The development would consist of a power plant with appurtenant facilities immediately below the North Fork Debris Dam and Reservoir, which was constructed by the Army Corps of Engineers.

Appropriation Bill Will Finance Transmission Lines

Funds provided in the Interior Department appropriation bill signed by President Truman Aug. 31, will permit construction of more than 700 miles of transmission lines by the Bonneville Power Administration, in addition to continued work on eleven 230,000-v arterial lines already under construction. The appropriations will permit work to start on new circuits from McNary Dam to Ross substation at Vancouver, Wash.; Detroit Dam to Chemawa, Ore., and Roseburg to Coos Bay, Ore.

Work on Rock Island Dam Speeded During Low Water

Concrete pouring on the Rock Island Dam heightening project is being speeded to take advantage of present low water in the river.

Some 600 men now are working on the project, contract for which is held by Atkinson & Ostrander under supervision of Stone & Webster. After the old concrete is chipped off, it is cleaned with a newly developed hydrosilica gun shooting water through a ⅜-in. nozzle at 1,500 lb pressure. Such cleaning was formerly done with water at 85 to 100 lb pressure.

Donald N. McCard, resident engineer for Stone & Webster, denied reports that water in the fish ladders was too low to permit fish to pass the dam. Water level always has been higher than the level specified by the Fish and Wildlife Service and since has been raised by pumping, he said.

Hungry Horse Reservoir Being Formed in Montana

What will ultimately be Montana's largest lake, Hungry Horse Reservoir, began forming in mid-September with closure of the 36-ft-diameter diversion tunnel from the south fork of the Flathead River.

The reservoir, which eventually will back up 34 miles to store 3,500,000 acre-ft of water, is expected to rise about 130 ft by mid-October. It will then be up to the level of three 8-ft-diameter river outlet pipes which will act, when needed, as a safety valve in the event of flood conditions.

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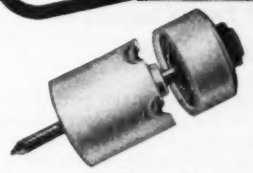

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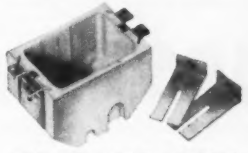

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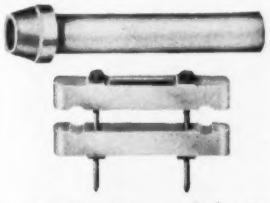

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ANCHORAGE PLANNING 6,000-KW STEAM PLANT

City of Anchorage, Alaska, has ordered plans for a 6,000-kw steam power plant to increase its existing facilities by more than 50%, at an estimated cost of $3 million. The issuance of bonds for the plant has already been approved by the voters. Preliminary studies by the Ferguson Engineering Co. of San Francisco indicated need for additional facilities, despite the supply to come eventually from the USBR's Eklutna hydroelectric project. Much of Anchorage's existing power equipment is war-surplus material which could break down long before completion of the Eklutna project, it was pointed out.

USBR Awards Contract for Eklutna Hydro Project

Contract for a major portion of the Eklutna hydroelectric development in Alaska has been awarded by the Bureau of Reclamation to Palmer Constructors of Omaha, Neb., for $17,348,865.

This was the lowest figure received under a second call for bids, almost $4 million below the low bid rejected last June.

The contract calls for a diversion tunnel 4 miles long and 9 ft in diameter from Lake Eklutna through Goat mountain to Knik Arm, a branch of the sea near Anchorage. It includes a concrete gate shaft 9 ft in diameter, a concrete surge tank 30 ft in internal diameter and a penstock tunnel varying in diameter from 6 to 7½ ft.

Total cost of the project, including a 30,000-kw power plant, is estimated at $33,800,000. Since total capacity of the plant will be completely taken as soon as it is finished, probably in 1955, the bureau has studies under way for other hydroelectric projects in the area.

● **Tucson Gas, Electric Light & Power Co.** directors have approved a $276,000 expansion for power and gas facilities and line extensions. According to J. R. Snider, company president, $234,392 will be spent for substation equipment and power lines and $41,784 to improve gas pressure. Completion is planned before summer.

SOUTHERN UTAH POWER BUILDING STEAM PLANT

Southern Utah Power Co. has awarded a contract for construction of a 5,000-kw steam generating plant to the Lym Engineering Co. of Salt Lake City. The low bid of $89,590 calls for erection of an all-steel building as the initial step in a $1,500,000 expansion program. Construction of the new steam plant, located adjacent to the present company installation on Coal Creek near Cedar City, is to be supervised by the Stone & Webster Engineering Corp. of Boston. The building is scheduled for completion Jan. 1, 1952, with all generating equipment to be installed by June 15, 1952.

● **Westinghouse** Electric Corp. will supply more than $3 million worth of electrical equipment for the new aluminum reduction plant being erected at Wenatchee, Wash., by the Aluminum Co. of America. The contract provides for 24 ignitron rectifier units as well as transformers and other auxiliary equipment, scheduled for delivery early next year.

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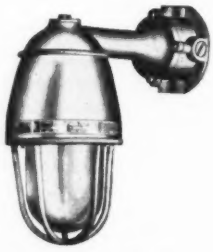

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B. C. PLANT WILL START OPERATIONS IN OCTOBER

Operations of the Lake Buntzen No. 1 hydroelectric plant's new 70,000 hp generator will commence during October, according to T. Ingledow, vice-president and chief engineer for B. C. Electric Co.

The new unit will replace seven old-type generators, which were in operation for nearly half a century. The largest ever installed in western Canada to date, it will have nearly three times the generating capacity of the plant's former output. The project is being developed at a cost of $3,500,000.

Opening of the new Buntzen No. 1 plant will raise to approximately 550,000 hp the capacity of B. C. Electric's Lower Mainland hydro generator system, as contrasted with 250,000 hp before the war.

B. C. Power Commission Will Spend $14 Million

Expansion during the present fiscal year will involve expenditure of $14 million by the B. C. Power Commission, it was reported recently.

Projects under construction or completed will require about $3,300,000 capital outlay. The fiscal year's program, some of which remains to be submitted to the government for final approval, includes new works totaling in excess of $11 million.

New generating equipment is expected to cost more than $1 million, apart from new units for John Hart development, which will add 56,000 hp.

The commission will require $1,750,000 for developments under consideration, and for distribution extension and improvements another $2 million will be required, it was announced.

A $970,000 transmission line is planned from John Hart plant to Duncan Bay for Elk Falls Timber Co. Ltd. Cost of transmission line from Clowhom Falls to Sechelt is estimated at $250,000. Another $50,000 will be needed for jobs at Duncan and Nanaimo.

● **Two contracts** have been awarded by the Corps of Engineers for equipment for McNary Dam. S. Morgan Smith Co. of York, Pa., will provide six 11,200-hp hydraulic turbines for $8,225,257 while the Gunderson Bros. Engineering Corp. of Portland will furnish spillway gates and appurtenances for $1,566,334.

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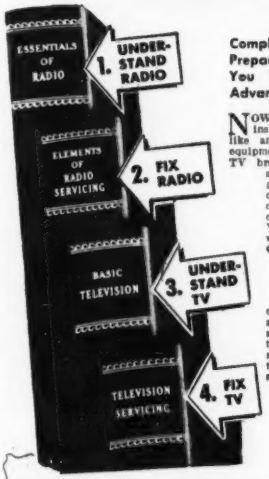

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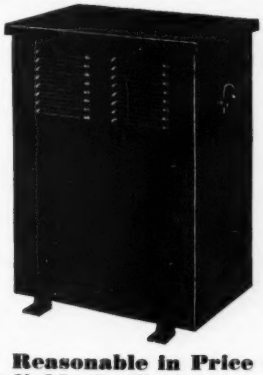

Reasonable in Price Reliable in Performance

Jeffries large transformers are priced reasonably—and you can save their first cost in a short time by minimizing current losses. When you use a Jeffries transformer, you can provide voltage change at the point desired, without prohibitive expense.

We supply all types and sizes. If not in stock, we build to order in a hurry—a week to 10 days.

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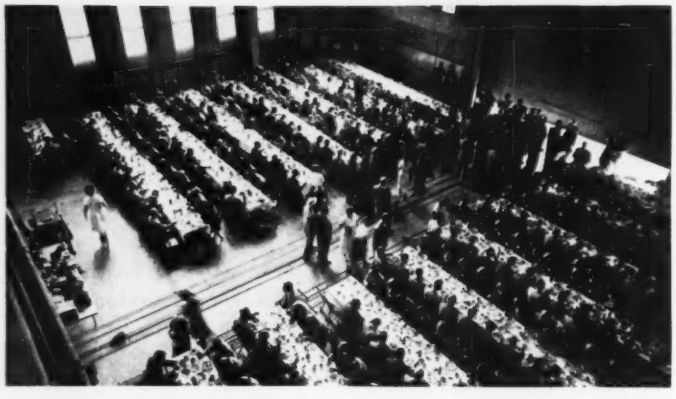
1710 E. 57th St. Los Angeles 11, Calif.



Formal dedication of Pacific Gas and Electric Co.'s Contra Costa steam plant was attended by some 400 civic and industrial leaders. Shown at top are D. D. Smalley, PG and E vice-president in charge of operations; W. G. B. Euler, executive vice-president; G. J. Knight, lieutenant governor of California; J. B. Black, president, PG and E; S. D. Bechtel, president, Bechtel Corp.; J. W. Swaren, Washington, D. C., representing the Industrial College of the Armed Forces; N. R. Sutherland, PG and E vice-president and general manager. The 300,000-kw plant is being extended to 500,000-kw capacity

● **Puget Sound Power** & Light Co. has gone to court in an effort to avoid payment of $450,000 in taxes for which it asserts it is not liable. The suit seeks to restrain the King County assessor from including on the 1952 tax roll property which the company sold to Seattle City Light last March. The law provides that taxes must be paid by whomever owned the property as of Jan. 1, 1951, County Assessor Ralph S. Stacy has stated.

● **Portland district, Corps of Engineers,** has awarded a contract to Pelton Water Wheel Co., San Francisco, for supplying three 52,000-hp hydraulic turbines for Lookout Point Dam, unit of the Willamette basin flood control and power project in Oregon.

● **The Bureau of Reclamation,** after completing a report on the Lake Dorothy hydroelectric project in Alaska, has recommended immediate construction of the project, according to a statement at Juneau by Joseph M. Morgan, district manager of the bureau. The development will have an ultimate capacity of 24,000 kw and will be capable of producing and making available to the area 123,000 kwh of firm power energy annually, Morgan said. It is near Point Bishop.

WATER CONDITIONS BOOST BONNEVILLE REVENUES

Excellent water conditions of the Columbia River for the fiscal year ending June 30 boosted Bonneville Power Administration gross annual revenues to more than $36 million, an increase of nearly $5 million over the previous year.

Net revenues for the year were $14,495,552, well up from $11,908,967 last year, according to Administrator Paul J. Raver.

Total cash receipts to the end of that year were $215,223,000 returned to the U. S. treasury for repayment of power expenses, interest and return of the power investment.

On Bonneville Dam, repayment to date of $38,163,000 has allowed return of $16,836,000 on the capital investment allocated to power, 28% of the total. Only seven years—14% —of the 50-year payout period has expired.

At Grand Coulee, repayments of captial investment to the Columbia Basin project total about $23,300,000, almost three times as much as the scheduled payment for this time of $8,009,000.

● **A preliminary budget** of $3,100,000, up $200,000 from this year's budget, has been approved for next year by Cowlitz PUD commissioners at Kelso, Wash. Greater part of the increase is the result of higher prices for materials, said Manager Glenn Hittle. Capital outlay will require $584,800, of which $419,800 will go for supplies and materials and $165,000 for wages connected with these jobs. Major construction planned for 1952 will be the rebuilding of 6 or 7 miles of transmission line, an addition to the Kelso substation and completion of the new West Kelso station.

● **More than** 30 miles of the projected 80-mile 115-kv transmission line linking Prescott and Flagstaff, Ariz., have been completed. The new line is designed to meet expansion requirements of the Flagstaff-Holbrook-Winslow sector of northern Arizona and ties the Northern Arizona Light & Power System into the transmission grid of the parent company, Central Arizona Light & Power.

● **Bids** received by the Chelan County PUD of Wenatchee, Wash., for a 16-mile 33-kv wood-pole transmission line were above the estimate, according to Manager C. H. George. The Hahn Electric Co. of Wenatchee is low at $96,000, for erection only.

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CONSTANT VOLTAGE BALLASTS

reduce air conditioning load

lower operating temperatures and increased efficiency can save as much as $1.14 investment in air conditioning per lamp.

Temperature rise of the 2-lamp SOLA Sequenstart* Ballast is exceptionally low, compared to the conventional lag-lead types. The patented SOLA Sequenstart* circuit greatly reduces the quantity of metal required in the ballast, minimizing iron and copper losses. This reduces the high ambient temperature surrounding ordinary ballasts.

In addition to cooler lighting, the circuit design of SOLA Sequenstart* Ballasts (which are wired in series rather than in parallel) results in greater efficiency. This means less wattage loss, and consequently less wattage necessary for a specified lighting level.

When you next purchase, specify or install fluorescent lighting, it will pay you to inquire of the fixture manufacturer about the ballast installed in the fixture.

Employment of SOLA Sequenstart* Ballasts for fluorescent lighting can make a very significant saving on installed and operating cost of an air conditioning system. Write for the complete story of air conditioning savings and increased fluorescent lighting performance through SOLA Sequenstart* Ballasts. Ask for Bulletin 29-FL-144.

Compare Ballast Performance—Then Specify The Outstanding Performer.

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CONSTANT VOLTAGE BALLASTS

SOLA ELECTRIC CO.
4633 W. 16th St., Chicago 50, Ill.

CALAPCO STARTS FOUR-YEAR STREET LIGHTING PROGRAM

Central Arizona Light & Power Co., at Phoenix, Ariz., has signed a $1,300,000 contract for a four-year street lighting program.

Calapco will pay all costs of construction and installation. The city will pay $254,000 a year for operating the system when it is completed. The city's street lighting costs last year were $83,000.

Under the proposed plan, Calapco will increase lighting units from the present 1,734 to a total of 5,494.

The contract is for 20 years with an automatic 10-year renewal clause after that time.

The city has the right to purchase the system at two-year intervals in segments of $250,000 each.

L. A. Department Installs Microwave Radio Relaying

The Los Angeles Department of Water & Power has installed a PTM microwave radio relay system linking its main office downtown with a steam plant at Seal Beach, 22 miles away.

Initially the system is equipped for operation on five voice channels and one telegraph channel, with provision for dispatching, telemetering and supervisory services. However it is designed for expansion to an 8-voice channel and, if desired, 19 additional telegraph channels may be provided on any one of the voice channels.

Equipment was made by Federal Telephone and Radio Corp., an associate of the International Telephone and Telegraph Corp.

Utility Asks Curtailment of Plane Flights Over Sub

Seattle City Light has asked the Air Force and the CAA to curtail plane flights near its big south substation, located about a mile north of Boeing Field.

In the event the substation were struck, one or two years would be required to restore it to full service, according to City Light Superintendent E. R. Hoffman. The station handles 60% of the electrical energy coming into Seattle.

● **The California Department of Industrial Relations** reports employment in the electrical machinery, equipment and supplies manufacturing industry in the state reached an all-time high in June. Wage and salary workers numbered 32,600 which was 25% more than at the wartime peak established in June 1944, and 34% above the total of 24,300 in June 1950. The increase constitutes the third largest rate of increase of any manufacturing industry, surpassed only by aircraft and machinery manufacturers.

Employee Suggestion Will Add Kilowatts at Plant

An idea submitted in Idaho Power's new employee suggestion program has added to the power output of the Lower Salmon Falls plant on the Snake River. The extra kilowatts will result from raising the pond level six inches by placing temporary flashboards across the short, 205-ft, spillway. George W. Johnson of Boise was awarded $330 for his winning suggestion in the contest, which produced 25 ideas from employees in its first two weeks.

● **Grays Harbor** PUD of Aberdeen, Wash., has been asked by the U. S. State Department for 7,500 kw of power for a $5 million Voice of America radio station to be constructed near that city. The station will be one of the two largest and most powerful in the world, according to Rep. Russell V. Mack of Hoquiam. A sister station will be constructed in North Carolina. Electronics engineers said the Aberdeen area was one of two that met all requirements for such a station.

● **Radio interference** susceptibility of the new conductor the Bonneville Power Administration proposes to use on transmission lines is being determined in wind tunnel tests at the University of Washington. The cable is ACSR of 1.6 in. diameter and is being made by Alcoa at Vancouver for use on Bonneville's new 287-kv lines. Wind velocities simulating field conditions are being employed.

● **Seattle City Light's** budget for 1952 has been set at $27,745,787, nearly $12 million above last year. Acquisition of Puget Sound Power & Light Co. facilities this year has sharply expanded the department's activities. The City Light budget is almost $6 million more than the amount needed to operate all city tax-supported departments, it was reported by city officials.

Electrical Equipment Advertisers Can Make More Money In The Western States

HOW ?

By using advertising in ELECTRICAL WEST to help their Western Sales representatives make more efficient use of their time in this widespread territory.

The 11 Western States comprise about a fifth of the market for every type of electrical equipment. (Over a billion dollars a year in prospect through 1955). This market is spread over 40% of the land area of the U.S. A difficult territory for salesmen to cover!

ELECTRICAL WEST gives more coverage of utility, wholesaler and contractor groups in this area than any other electrical magazine. The additional readership and penetration gives the electrical equipment advertiser powerful penetration to all parts of this rich market. This vigorous publication does more than duplicate your national magazine coverage — it carries your sales messages to worthwhile people who might not otherwise see either your ads or your salesmen.

Utility subscribers, for example, number nearly 5,000, against the top national magazine's 2,600 for the area. This includes private municipal, Federal and PUD electric operations. Extra wholesaler and contractor coverage is equally valuable.

So, we repeat, by providing extra advertising help for their salesmen in this rich, but widespread area

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Ask our nearest representative to show you our study on the purchasing procedure of a large West Coast utility.

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Dick Alcorn . . . . . San Francisco 4
68 Post St.

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HIGH COSTS KILL PLANS FOR UNDERGROUND WIRING

High costs have killed Victoria, B. C., plans to put all overhead wiring underground. The decision to abandon the project was approved by the public works committee of the city council following presentation of a report by E. W. Arnott, B. C. Electric Co. vice-president, in which he estimated it would cost between $12 and $14 million to convert Victoria from an overhead to an underground system. And this estimate, he said, was based on conditions as they existed last November. Between 20% and 25% would have to be added to cost figures to bring the estimate up to date.

● **Bids** have been called for construction of a Roosevelt Memorial along the shores of Franklin D. Roosevelt Lake near the east abutment of Grand Coulee Dam. The heart of the memorial will be a reflecting pool in which will be mounted a large bust of the late president which was designed by a Portland architect, Frederic Littman. The Franklin D. Roosevelt plaque which is located on a temporary base in Mead Circle of Coulee Dam will be moved to the new memorial area.

● **FPC** has granted a 50-year license to Oakdale Irrigation District, Oakdale, Calif., and South San Joaquin Irrigation District, Manteca, Calif., for construction of a hydro project on the Stanislaus River. The power house would contain two 11,500-hp turbines and two direct-connected 8,500-kw generators.

● **El Paso Electric Co.** in Texas has asked FPC authorization to issue $2,500,000 principal amount of promissory notes, payable April 30, 1952. Proceeds would be used to help finance the company's 1951-52 construction program.

● **PFC** has authorized Idaho Power Co. to issue $15 million in first mortgage bonds and to make additional short-term bank borrowings. The commission at the same time denied the company's request for exemption from its competitive bidding requirements for the bond issue.

● **Reddy Kilowatt,** riding a candy train, won first prize, commercial class, for British Columbia Electric Co. in the recent Queen Victoria's birthday parade at Victoria, B. C.

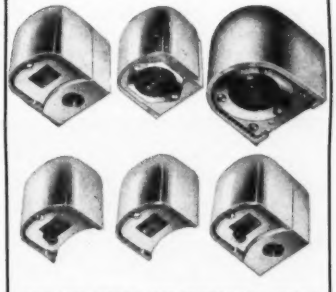
You don't need an Umbrella to Protect

Revere

and SWITCHES RECEPTACLES

they're Weather-proof

6 Types
3 Sizes
125-250 Volts



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Full Line of Incandescent & Mercury Luminaires Including One-Piece Hexagon Standards

Latest C-1 High Intensity Runway Marker

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LOS ANGELES REP.: BRACKEN SALES AGENCY

NOTES ON THE TRADE

● **Pacific Electric Mfg. Corp.'s** new Santa Clara plant was dedicated Sept. 7 with an "industry-in-action" open house. The program included a Pacific Electric Day luncheon sponsored by the San Jose Chamber of Commerce, at which Joseph S. Thompson, PEM president, and his sister, Kathleen Norris, were speakers; an invitational plant inspection and reception; a public open house in the evening. The $65,000 plant, shown at right, incorporates late improvements in industrial design and color.

At dedication of Pacific Electric's new plant, President Joseph S. Thompson shows a working model of the company's air break switch to Kathleen Norris at left and at right is pictured with E. F. Sixtus, vice-president in charge of sales; A. A. Browne, vice-president and general manager; James A. Thompson, vice-president of Pacific Electric. The new plant is shown above

● **Wismer & Becker,** electrical contracting engineers of Sacramento, have moved to new and larger quarters at 1731 S St., corner 18th, in Sacramento. The new plant gives improved motor repair and service shop facilities, more space for contracting tools, materials and supplies, and better offices for engineering and layouts. The company has done a wide variety of construction jobs from power plants for PG and E to commercial and industrial lighting.

● **Purchase** of the Elco Construction Co. of Littleton by the Sturgeon Electric Co. of Denver has been announced by **Ralph Johnson,** Sturgeon vice-president and general manager. The Elco company, established in 1946, was engaged in high-voltage power and pole installations. All Elco equipment has been acquired by Sturgeon and will be used to expand the pole and high-voltage construction department of that company. Sturgeon, formed in 1912 by **Dave Sturgeon,** president, offers electrical and engineering service, including power installations, heavy motor service, line construction, lighting installation and design and home repair service.

● **Harry F. Ream Sales Agency,** 2695 Newland St., Denver, will represent Royal Electric Co. of Pawtucket, R. I., in Colorado, Utah, Wyoming, Idaho and Montana. The company makes insulated wires, wiring devices, fuses, cord sets, trouble lights and decorative Christmas lighting. Ream succeeds the late E. C. Holloway.

● American Steel & Wire Co. has named **H. C. Hoy** manager of sales in the Denver district, succeeding **Thurman Haskell,** who has been transferred to Chicago.

● **Electrical** appliances are being offered by the T. Eaton Co. Western Ltd. in two branch stores established at Trail and Kelowna, B. C. The new branches will act as mail order stores and retail outlets.

● **Michael R. Buehner** has been appointed chief mechanical engineer for Hoffman Radio Corp., Los Angeles.

● **Extruders Inc.,** manufacturer of plastic tubing and films, has moved to a new factory at 3232 W. El Segundo Blvd., Hawthorne, Calif. Former location of the plant was in Culver City.

NOW

All Three in One High-Voltage Cable

- **MOISTURE RESISTANCE**
- **OZONE RESISTANCE**
- **RESISTANCE TO HEAT AND AGING**

For the first time these three important properties, moisture resistance, ozone resistance, and resistance to heat and aging, are combined in a single high-voltage insulation. Simplex-Anhydrex XX insulation has proved itself to be far and away your most dependable assurance of low cost, trouble-free cable operation at the higher voltages. Here's why:

Aged for 16 weeks at 250°F. (121°C.), Simplex-Anhydrex XX retained approximately 50% of its tensile strength, nearly 68% of its elongation. More than that, its rate of deterioration after the first few weeks was very slight, indicating exceptional stability and long life. It remained rubber-like in quality and appearance and was still suitable for further use. Compare this with ordinary vegetable oil base and heat-resistant compounds which, inside of only 3 weeks, became brittle, cracked and crumbled.

Aged for 7 days at 250°F. (121°C.), Anhydrex XX was then immersed for a week in distilled water at 158°F. (70°C.). It absorbed less than 15 mg. per square inch of exposed surface.

Aged for 7 days at 250°F. (121°C.), Simplex-Anhydrex XX was bent around a mandrel and exposed to .03% ozone for 4 hours yet would not crack.

Compare these values with those of any other high-voltage insulation. You'll find a big difference whenever Simplex-ANHYDREX XX Cables are on the job; a difference that pays off in more economical, more efficient, and more reliable power transmission. If you would like more complete information and specification data on Anhydrex XX insulation, simply drop us a line at the address below.

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TRANSFORMER CO.
INTRODUCES
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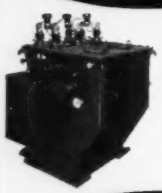

20.8 Kva, 2400 Volts through 750 Kva, 13,800 Volts

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UTILITIES ENGINEERS

Associate positions at $458—$556 month. Assistants, $376—$458. Both positions require experience in public utilities or allied industries. Apply before November 24. State Personnel Board, 1015 L Street, Sacramento, California.

NEWS ABOUT PEOPLE

● **P. C. Spowart,** sales manager of Seattle City Light, has been appointed assistant to Superintendent E. R. Hoffman. Hoffman has two other assistants: **John M. Nelson,** in charge of engineering; and **Ira L. Cottom,** in charge of personnel and business. Spowart, a veteran employee, specializes in public relations. Two other new positions have been created. **E. E. Scott** was appointed assistant headworks superintendent for the Skagit River projects to aid **Dana Currier,** headworks superintendent, who soon will retire. **Don Forsander,** senior contract agent who has been assigned to personnel work, has been named personnel officer.

● **Fred Oldendorf Jr.,** vice-president of California Electric Power Co., has been appointed assistant general manager. He will report to C. C. Ernst, vice-president and general manager, at Riverside, Calif. Oldendorf started with the company as a clerk in the operating department. He became assistant to the president in 1944 and two years later was elected vice-president.

● **F. O. McMillan,** head of electrical engineering at Oregon State college and recently elected president of the American Institute of Electrical Engineers, has gone to Europe as official representative of AIEE at a conference of engineering societies of western Europe and the United States at The Hague. Following the conference he will inspect hydroelectric power developments on the continent.

● **Richard L. Boke** has rejoined the Bureau of Reclamation and returned to his former position as regional director at Sacramento, Calif. Boke resigned recently to take a state department appointment in Iraq, but was advised by physicians not to go into that climate.

● Appointment of **Oliver O. Rands** as chief of the USBR's division of power utilization for Region 2, Sacramento, was announced recently. He succeeds **Henry B. Taliaferro,** who has been transferred to Washington, D. C. Rands is a native of Salt Lake City and was graduated from the University of Utah in electrical engineering in 1931.

Everett

● **Robert L. Everett** was named supervisor of industrial relations of the Sunnyvale plant of Westinghouse Electric Corp. A native of Spokane, Everett has been with Westinghouse at Sunnyvale and at St. Louis.

● Two appointments have been announced by Pacific Power & Light Co. **E. Robert de Luccia,** manager and chief engineer of the Yale Dam development on the Lewis River in southwestern Washington, has been elected vice-president. **H. W. Millay** has been named secretary to succeed **J. G. Hawkins,** who will retire after 42 years with the company. Both new officers will have headquarters in Portland.

● **Charles A. Jinkner,** Westinghouse man who helped build Grand Coulee's 18 generators, was at the dam last month to participate in ceremonies marking completion of the power house installation. Now an assistant superintendent of manufacturing in the transportation and generator division at East Pittsburgh, Jinker joined Westinghouse in 1907. A ceremony staged in connection with the installation honored representatives of workmen in plants where turbines and generators were built.

● Two Westerners were among speakers for the Workshop Conference of the Electric Companies Public Information Program held in Chicago, Sept. 20-21. They were **Henry Sargent,** president, Central Arizona Light & Power Co., who discussed national power policy developments, and **Dr. Adam S. Bennion,** Utah Power & Light Co., who took part in a symposium on "What We Have Learned Through PIP."

● Three Pacific Northwest men have been appointed to an advisory board to assist the DEPA in dealing with the regional power shortage. They are **Owen Hurd** of Prosser, Wash., manager of the Benton County PUD and president of the Northwest Public Power Assn.; **D. Loring Marlett,** assistant administrator of the Bonneville Power Administration; **James H. Polhemus,** president of the Portland General Electric Co.

● **W. J. Blackburn** has been made industrial manager for Minneapolis-Honeywell Regulator Co. at Denver. He succeeds **Donald W. Larcen,** who was recalled to active military duty. Blackburn was transferred from the Kansas City office.

Deaths

● **Ben Duncan Moses,** professor emeritus of agricultural engineering, University of California, and for 25 years secretary of the Committee on the Relation of Electricity to Agriculture, died Sept. 7 in San Francisco. He was 68 years old. Professor Moses was stricken last August while on vacation in the Sierra. A native of New Mexico, he attended the University of California at Berkeley, receiving the B.S. degree in mechanical engineering in 1909. He worked in the experimental department of the Holt Mfg. Co. of Stockton and as southwestern branch manager of the Yuga Mfg. Co. of Dalles, Tex., before joining the UC staff at Davis in 1922. He retired in 1950 and had been living in Carlsbad, Calif., where he taught in the Army and Navy Military Academy. He was the author of more than 40 publications, including university bulletins and technical papers. He was an outstanding teacher and an international authority on farm power. As secretary of the CREA he was responsible for much of the progress in electrifying California farms. In 1950 he received a plaque in recognition of his service to this committee.

● **Dr. W. A. Carrothers,** 62, chairman of the British Columbia Public Utilities Commission for 12 years, died of a heart attack at Victoria. He had been in poor health for some months.

● **Claude A. Andrus,** 65, retired City Light electrical engineer at Seattle, died Aug. 25 after a long illness. He was in charge of designing City Light's Diablo Dam power house on the Skagit River, and retired in 1939.

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ABOLITE Lighting
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• Commercial . . . Floodlighting
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The JONES METAL PRODUCTS CO.
WEST LAFAYETTE, OHIO
Sold Exclusively through Electrical Wholesalers

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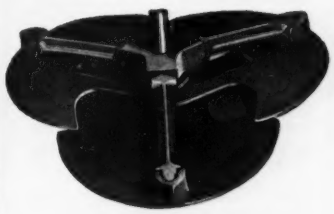

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STATEMENT OF THE OWNERSHIP, MANAGEMENT, AND CIRCULATION REQUIRED BY the Act of Congress of August 24, 1912, as amended by the Acts of March 3, 1933, and July 2, 1946 (Title 39, United States Code, Section 233) of Electrical West, published Monthly at Los Angeles, Calif., for October 1, 1951.

1. The names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher, McGraw-Hill Company of California.....68 Post St., San Francisco 4, Calif.
Editor, George C. Tenney .....68 Post St., San Francisco 4, Calif.
Managing Editor .....None
Business Manager, John W. Otterson .....68 Post St., San Francisco 4, Calif.

2. The owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding 1 percent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a partnership or other unincorporated firm, its name and address, as well as that of each individual member, must be given.)

McGraw-Hill Company of California, 68 Post St., San Francisco 4, Calif.; McGraw-Hill Publishing Co., Inc., 330 West 42nd St., New York City; Curtis McGraw, 330 West 42nd St., New York City; J. A. Gerardi, 330 West 42nd St., New York City; W. T. Chevalier, 330 West 42nd St., New York City; George C. Tenney, 68 Post St., San Francisco, Calif.; John W. Otterson, 68 Post St., San Francisco, Calif.; H. B. Hicks, 68 Post St., San Francisco, Calif.

3. The known bondholders, mortgagees, and other security holders owning or holding 1 percent or more of total amount of bonds, mortgages, or other securities are: If there are none, so state.)

None.

4. Paragraphs 2 and 3 include, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting; also the statements in the two paragraphs show the affiant's fullknowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bonda fide owner.

5. The average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the 12 months preceding the date shown above was: (This information is required from daily, weekly, semiweekly, and triweekly newspapers only.)

GEORGE C. TENNEY, Editor.

Sworn to and subscribed before me this 28th day of September, 1951.

[SEAL] ELVA G. MASLIN,

Notary Public, State of New York, No. 30-7750500 Qualified in Nassau County. Certificates filed with New York County Clerk's and Register's Office. (My commission expires March 30, 1952.)

INDEX TO ADVERTISERS
OCTOBER 1951

Advertising Council 109
Allis-Chalmers Mfg. Company 13, 35, 63, 105
All Steel Equipment, Inc. 16
Anaconda Wire & Cable 19

Brewer-Titchener Corp. 31
Briegel Method Tool Company 34
BullDog Electric Products 39

Certified Equipment Mfrs., Ballasts 32
Clark Controller Company 47
Classified 130
Cole Electric Company 134
Condon Company, Earl S. 54
Copperweld Steel Company 26
Corrin, J. G. 130

Davey Tree Surgery 113
Day-Brite Lighting, Inc. 61

Electric Equipment Company 131
Electrical Engineers Equipment Co. 116
Electrical Specialty Company 123
Electrical West 127
Essex Wire Corp. 50
Everstick Anchor Company 131

Federal Electric Products Company 24

General Electric Co.:
Bridgeport, Construction Materials Dept. 103
Schenectady, Apparatus Dept. 1, 8, 28, 29, 43, 55
Syracuse, Electronics Dept. 4, 5
General Switch Corp. 36
Graybar Electric Co. Inc. 9

Honn, George E. 130
Hotpoint, Inc. 51
Hubbard & Company 23

Indiana Steel & Wire 116
Industrial Electronics Corp. 50
Irvington Varnish & Ins. Co. 59

Jeffries Transformer Company 123
Jones Metal Products Co. 131

Kerite Company 60
Killark Electric Mfg. Co. 122
Klein Co., Mathias & Sons 44

Line Material Company 3

McCabe-Powers Auto Body Co. 27
McGraw-Hill Book Company 123

National Electric Products Corp. 14, 15
National Telephone Supply Co. 125
National Varnished Products Corp. 33

Ohio Carbon Company 52
Ownership Statement 131

Pacific Coast Electrical Association ..... 4th Cover
Pacific Gas and Electric Company ..... 3rd Cover
Panama Lamp & Commercial Co. 116
Paranite Wire & Cable Div. 113
Penn-Union Electric Corp. 30
Peterson Engineering Company 54
Porcelain Insulator Corp. 119
Porcelain Products, Inc. 121
Preformed Line Products 20, 21
Pyle-National Co. 107

Revere Electric Mfg. Co. 127
Rockbestos Products Corp. 133
Roebling's Sons Co., John A. 22
Rome Cable Corp. 17
Russell & Stoll Co. Inc. 112

Shell Oil Company 25
Simplex Wire & Cable Co. 129
Smoot-Holman Company 6
Sola Electric Company 126
Southern California Edison Company 2nd Cover
Spang-Chalfant Div., National Supply Co. 111
Square D Company 45
Standard Oil Company 120
Steel City Electric Co. 64
Sunbeam Lighting Company 53
Sylvania Electric Products, Inc. 37

Tel-E-Loct Products Inc. 119
Tork Clock Co. Inc. 112
Triangle Conduit & Cable Co. 12

Union Insulating Co. Inc. 58
United States Rubber Co. 7

Victor Insulators, Inc. 115

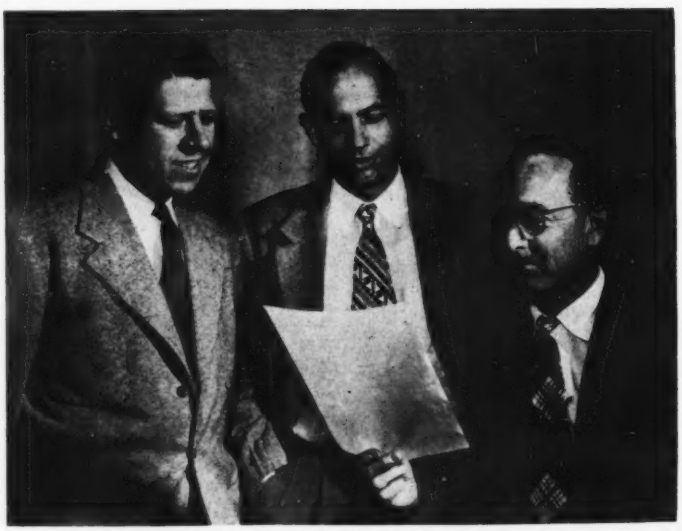
Wagner Electric Corp. 18
Wagner Malleable Products Co. 52
Western Insulated Wire 46
Westinghouse Electric Corp. 10, 11, 40, 41, 48, 49, 56, 57

PROFILES

Working together for Los Angeles Electric Club was so happy that Ethel Sanborn, executive secretary of the club, and Art Howard, sales manager, Tri-State Supply Co., president of the club last year, decided to make the partnership permanent, were married Aug. 4, honeymooned in Hawaii

San Francisco Electrical Contractors Assn. celebrated "old timers" day with a spicy stag. Old timers and officers at head table were Roy Moser, W. T. Kennedy, president, Ed Scott, secretary, Rod Newman, vice-president, and Carl Severin, past president. Officers later entertained top IBEW officials attending the AF of L convention

Bottom, winners in Richland, Wash., Section AIEE technical papers contest: H. A. Carlberg, first; T. B. Correy, second; C. B. Wagner, third, all of General Electric



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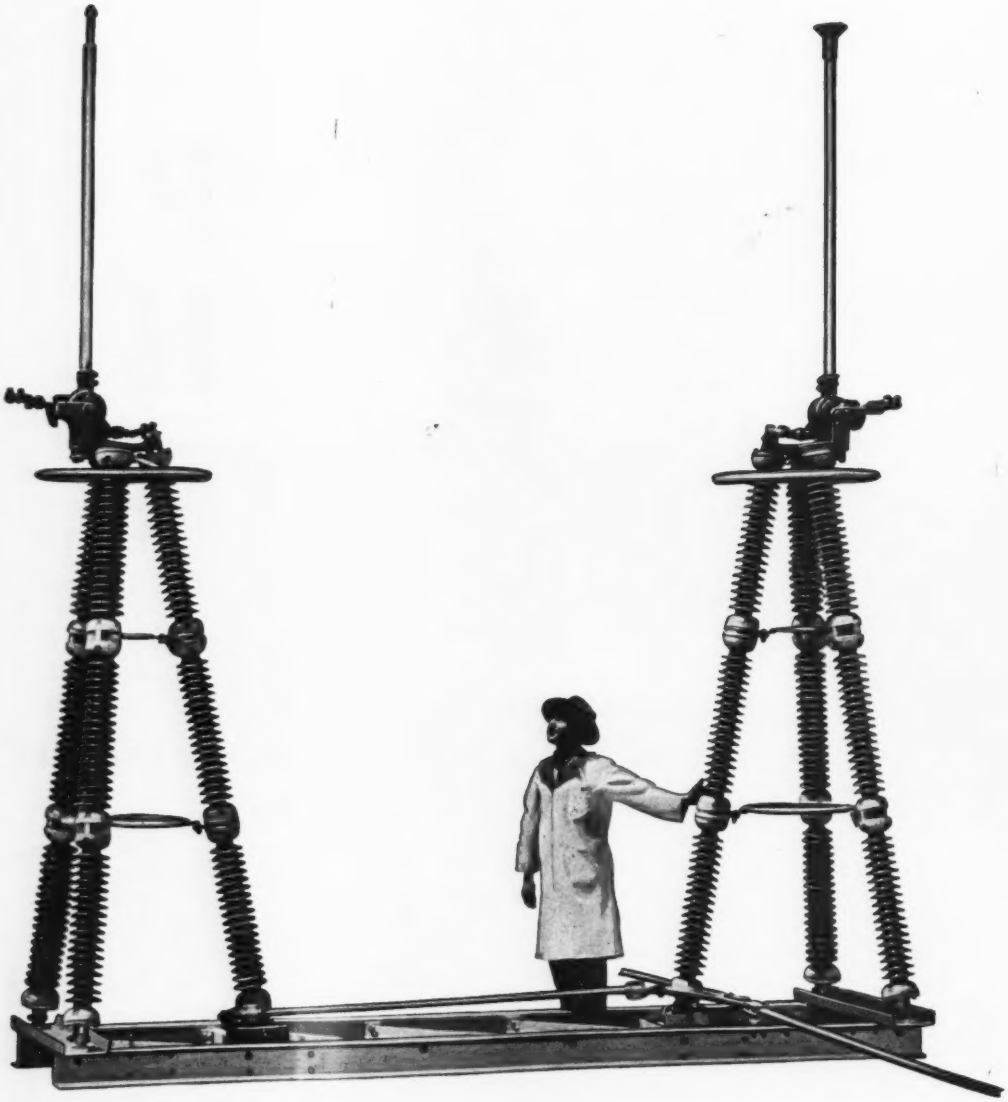

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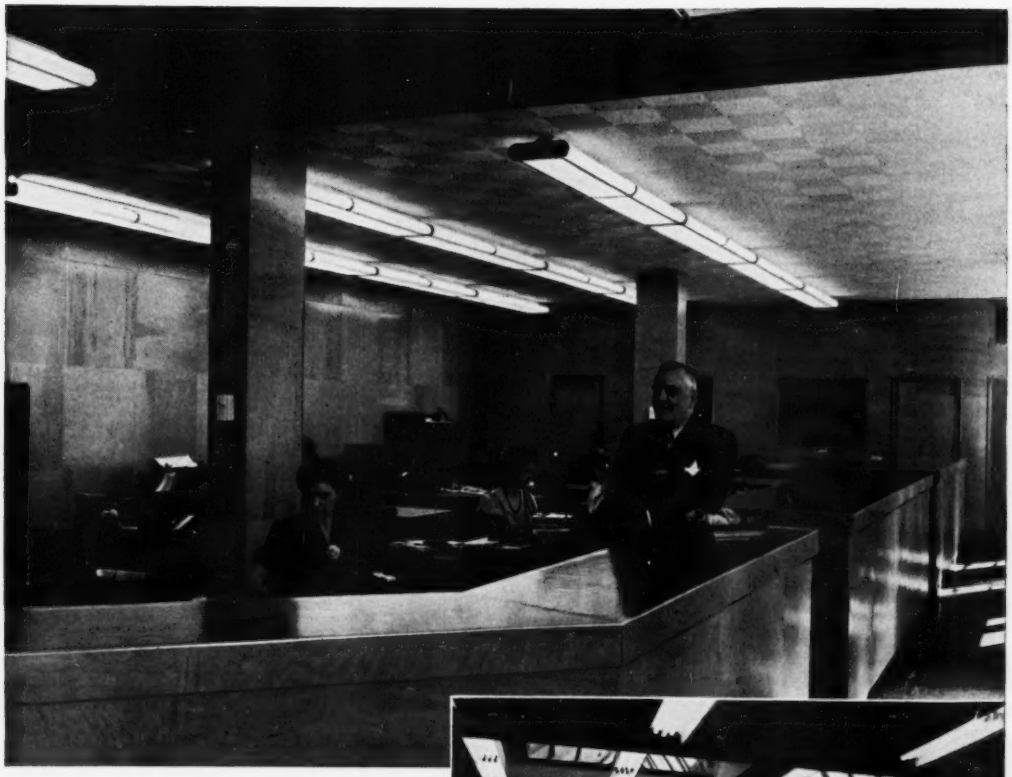

When Roy Brown, former president of CNPA and NEA remodeled his *San Rafael Independent-Journal* plant, he insisted upon having modern, planned lighting both in the shop and in the front office. The results? "...increased our efficiency and accuracy, and no more eye strain," writes Mr. Brown.

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